REPORT

OF THE

COMMISSIONERS

INVITED BY THE

CANAL BOARD OF THE STATE OF NEW YORK,

JULY 10th, 1877.

TO CONSIDER AND REPORT ON THE SUBJECT OF TOLLS UPON THE CANALS, HAVING REFERENCE TO THE SUBJECT OF REVENUES, AND ALSO TO INCREASING THE COMMERCE OF THE CANALS.

DAVID A. WELLS,
L. J. N. STARK,
WILLIAM THURSTONE, } *Commissioners.*

ALBANY:
WEED, PARSONS & COMPANY, PRINTERS.
1878.

At a meeting of the Canal Board, held at the Canal Department, the 13th day of February, in the year 1878,

Present: The Lieutenant-Governor, Secretary of State, Treasurer, and Attorney-General.

Messrs. David A. Wells and William Thurstone, of the commission appointed by this board, July 10, 1877, "to consider the subject of tolls upon the canals," presented their report.

On motion of the Attorney-General, the report was ordered to be printed in full in the minutes of the board.

On motion of the Treasurer, it was ordered that eight hundred extra copies be printed in pamphlet form.

Adjourned.

STATE OF NEW YORK:

CANAL DEPARTMENT,
ALBANY, *February* 16, 1877.

At a meeting of the Canal Board, held at this department, on Tuesday, July 10, 1877, the following was adopted:

"The undersigned respectfully report that they recommend that David A. Wells, Lucius J. N. Stark and William Thurstone be invited to act as a commission to consider the subject of tolls upon the canals, and report at their convenience to this board, having reference in such report to the subject of revenues, and also to increasing the commerce of the canals."

WILLIAM DORSHEIMER,
F. P. OLCOTT,
CHAS. M. ROSS,
Commissioners.

W. McGOURKEY,
Deputy Auditor.

REPORT.

ALBANY, *February*, 1878.

To the Canal Board of the State of New York:

The undersigned, having in accordance with the above invitation consented to act as a commission for the purposes indicated, do here present the following report:

Although the topics for inquiry specified in the above letter are apparently limited, they really involve a larger, and in fact, the only important question at issue, namely: *What shall be the policy of the State in the future in respect to the Erie canal, and the other canals adjunct or lateral to the same, the ownership (and inferentially the management) of which is by the Constitution of this State, made obligatory on the State?* To help answer this question it is important to first briefly consider. *What the Erie canal and its adjunct and lateral canals are? What have been their costs and revenues? and what the services they render or are capable of rendering?*

WHAT IS THE ERIE CANAL?

The Erie canal is the largest and most important canal in the United States, and outside of China, in the world. It forms the connecting link of water navigation between the Hudson river and tide-water at Albany and Troy and the chain of inland lakes, or seas, which extend to the center of the continent; connecting with Lake Erie at Buffalo and with Lake Ontario at Oswego. Its length from Buffalo to Albany is 352 miles (to West Troy 347 miles). The entire canal system of New York (and all the canals of the State are a part of one system) has a lineal length of 906.95 miles navigable water way and feeders.

The construction of the Erie canal was commenced in 1817. It was opened to navigation to Buffalo in 1825, and to Oswego in 1828. As originally constructed, it had a width of forty feet at the

surface; a depth of four feet; and a capacity for boats of seventy-six tons, as a maximum. Before its completion the average time occupied in the transportation of freight between Albany and Buffalo was about twenty days, at an average cost of at least, seventy-five dollars per ton. In 1876, the average time for the movement of a ton of freight from Buffalo to Albany was *eleven days*, at an average cost (freight and tolls) of $2.04 per ton.

The development of commerce on the line of the canal increasing after its opening, with a rapidity that far surpassed the anticipations of the projectors of the canal, cheaper transportation and greater capacity were both demanded; and accordingly between 1835 and 1862, the canal was enlarged to such an extent that it is now (in theory *), seventy feet wide at the water-line, fifty-six feet at the bottom, with a depth of seven feet; and a capacity for boats of 240 tons burden; although the average cargo transported is considerably less, namely: 213 tons (average) in 1873; 197 tons in 1874 and 1875; and 209 tons in 1876. The reported immediate results of the enlargement were to increase the *capacity* of the canal from an annual tonnage movement of *five* millions to *sixteen* millions; and to reduce the cost of transportation to the extent of about one-half. In 1876, a system of double locks was completed and brought into use along the entire length of the Erie canal. The theoretical capacity of the Erie canal, as it is at the present time, is probably three or four times greater than the largest tonnage than has ever in any one year moved upon it.

Fiscal Results of the Erie Canal.

The first cost of the Erie canal was estimated (in 1825–26) at $7,143,000.

Fiscal Results of the First Forty Years, 1826–1866.—By a report made by the Auditor of the Canal Department to the New

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* "The water-way was practically never excavated in every part to its proper dimensions. Time, the action of the elements, and neglect of administration, all tend to fill it with deposits." *Message of the Governor of New York, January*, 1875.

The dimensions of the canals between Lake Erie and Montreal agreed upon by the Dominion government in 1870, were one hundred feet width at bottom, with locks two hundred and seventy feet long between the gates, forty-five feet in width, and a depth suited to the passage of vessels drawing twelve feet of water. By instructions issued to the chief engineer of the board of public works of Canada in 1875, it was directed that all the more important permanent structures on the Welland and Lachine canals "should be adapted to a depth of water corresponding to fourteen feet on the miter sills of the locks."

York constitutional convention in 1867, the total expenditures, up to the close of the fiscal year 1866, on account of the Erie canal, *i. e.*, for construction, enlargement, maintenance and repairs, with interest, were $140,430,953.

The receipts from tolls, with interest, during the same period, from the Erie canal, were $181,828,604.

It appears, therefore, that the Erie canal at the close of the fiscal year 1866, had, during the then forty years of its existence and operation, not only repaid from the receipts for its use, every dollar expended upon it, but had yielded, in addition to the State Treasury, a surplus of $41,397,651. All this large sum, and some several millions additional, had, up to that time, however, been absorbed in the construction and maintenance of the Champlain and the lateral canals, the expenditures on account of which had exceeded the receipts, from tolls for their use, by the sum of $48,871,643.

The general result of the engaging by the State in the business of canal construction and management up to the year 1866 had, therefore, resulted in a direct loss of $7,473,922.

Fiscal Results of the Erie and Champlain Canals for the Twenty-six Years prior to 1872.—From a statement made by the State Auditor to the legislature in March, 1873, it further appears that during the twenty-six years ending with the fiscal year 1872, the total receipts from the Erie and Champlain canals amounted to $81,952,010; and that the total expenditures for administration, maintenance and repairs, and damages were $22,075,570; showing a *net* income of $59,876,440, or 73 per cent of the gross income during the period under consideration.

If the State of New York had run the Erie and Champlain canals as a business investment, it would have realized an annual average net profit for each and every one of the twenty-six years prior to 1872, of $2,148,410.

Fiscal Results of the New York Canals from 1860 *to* 1870, *inclusive.*—By report of the State Auditor (January, 1878), it appears that the aggregate surplus revenue derived from the New York canals during the eleven years from 1860 to 1870, inclusive, was $30,804,610. Of this surplus, $16,048,783 were actually applied to the payment and reduction of State (canal?) interest bearing debt, and the balance to the payment of interest and for the contributions required by the constitution towards the support of the State government.

Fiscal Results from 1869–70 *to* 1872–3, *inclusive.*—Coming

down to a later period, the fiscal results of the entire canal system of New York, for the four years ending September 30, 1873, appear to have been as follows:

Receipts from tolls	$11, 976, 512
" " Miscellaneous, water rents, etc	355, 250
Total	$12, 321, 762

The disbursements for maintenance and *ordinary* repairs for the same period were $9,889,078, leaving a balance in favor of the canals of $2,432,684.

There were, however, disbursements for *extraordinary* repairs during this same period, which amounted to $6,385,049; which, included in the total for the four years, gave an aggregate of $16,274,128 total expenses, and created a balance adverse to the canals for the period under consideration of $3,952,366, or at an average of $988,090 per annum.

During the same four years there was a charge against the canals for interest of $2,715,240. Including this amount, the total of charges and disbursements against the canals for the four years ending September 30, 1873—exclusive of any constitutional liabilities for contributions for the payment of any debts, and for the support of the State government—becomes $18,989,368; and the deficiency of receipts to meet such charges and disbursements rises to $6,707,606. Including the constitutional obligations imposed on the canals for annual payments, the deficiency would have to be represented by much larger figures; but, whatever it was, it was met by the proceeds of general State taxation.

The receipts from all the lateral canals (except the Champlain and Oswego canals) were, for the four years ending September 30, 1873, $285,767.76; and the disbursements for their maintenance and administration during the same period, $3,652,715, leaving a deficiency of $3,366,947.

The receipts from *tolls* from the Erie, Champlain and Oswego canals on the other hand, for the four years ending September 30, 1873, were $11,745,777; and the disbursements (ordinary repairs and maintenance, $5,127,918; extraordinary repairs, $4,930,350), were $10,064,269; leaving a balance to the credit of these canals for this period of $1,681,508.

It is therefore apparent that although the average receipts for the use of the canals (tolls and water rents) for each of the years from 1868–9 to 1872–3 exceeded the large sum of three millions of dollars

per annum, the general fiscal result of canal ownership and management to the State during these years was eminently disastrous.

During all this period, and before, the rates of toll maintained and collected by the State were high. During the season of 1869, the toll on wheat from Buffalo to Troy was 06.2 cents per bushel, and on corn to September 19, 04.8 cents per bushel. During the past season (1877) the ruling rates for canal freights (tolls included) from Buffalo to New York were for a considerable period under six cents per bushel for wheat, and four and one-half cents and less for corn. The tolls, therefore, paid on the movment of wheat and corn on the Erie canal for 1869 were more than it cost (tolls inclusive) to move the same property during a portion of the season of 1877. In 1870 there was a notable reduction of the canal tolls; but from 1870 to 1874 inclusive the toll on wheat *from Buffalo to Troy* was 03.1, and on corn 03.0 cents per bushel, while the rates for freights (tolls included) *from Buffalo to New York*, during a part of the season of 1877, were as low as five and five and one-quarter cents per bushel for wheat and four and four and one quarter per bushel for corn.

The administration and results of the management of the canals of the State of New York for the four years prior to and including 1873, were, to say the least, something extraordinary. What would have been the result had the tolls on the canals been reduced as early as 1860 to a rate not exceeding ten per cent on the cost of moving the property with a profit to the transporters or forwarders, it may not now be easy to fully state. But, judging from the experience of the past year, it is certain that the canals would have retained a vast amount of business which has gradually left them and gone to the railroads; that a large amount of railroad construction which has since been made, would never have been projected; that the economy in the maintenance of the canals, which has since been forced, would have been earlier entered upon; and that a vast amount of taxation, direct and indirect, not only on the people of the State of New York, but on the whole country, would have been prevented.

Since and including 1873, the receipts and the expenditures of the canals of the State of New York, for administration and all repairs, have been as follows; the period covered being one in which the business of canal transportation, owing to continued and unusual business depression and severe railroad competition, has been carried on under circumstances as unfavorable as are ever likely to be again experienced:

Fiscal years.	Receipts from all sources.	Expenditures and ordinary repairs.	Surplus revenue.	Extraordinary repairs, damages, new work, etc.	General fiscal result of the year, exclusive of the interest on and payment of the principal of any debt, and any contribution to the expenses of the State.
1873	*$3,082,452 00	$1,459,165 00	$1,623,286 00	$1,823,585 00	$200,298 00 deficiency.
	3,021,603 00 tolls				
1874	†2,947,972 00	1,469,466 00	1,478,506 00	1,398,640 00	79,866 00 surplus.
	2,921,721 00 tolls				
1875	‡1,925,995 00	1,414,586 00	516,538 00	973,313 00	461,904 00 deficiency.
	1,902,990 00 tolls				
1876	1,487,332 00	1,149,194 00	338,138 00	510,650 00	172,562 00 deficiency.
	1,477,331 00 tolls				
1877	1,053,361 00	§1,050,329 00	3,031 33	267,812 00	264,781 47 surplus.
	1,041,690 00 tolls				
1877 (calendar year).	880,000 00	....	.....	.....	.....

* See report of Comptroller, 1874, p. 126.
† See report of Comptroller, 1875, p. 131.
‡ See report of Comptroller, 1876, p. 134.
§ Governor's message, 1878, p. 8; Comptroller's report, 1878, p. 17; State Auditor's report, 1878, pp. 5, 6.

The above table does not include any constitutional obligations imposed on the canals for payments on account of the interest or principal of any debts, or for the support of the State government. These obligations for the fiscal year 1877, according to the Canal Auditor (Report January, 1878, p. 9), were specifically and in the aggregate as follows :

To pay the interest of the debt, *in coin*	$577,210
To contribution to the sinking fund	450,000
For the support of the State government	200,000
Total	$1,227,210

It would, therefore, appear from the above tables and analysis, that in every year from 1873 to 1877, inclusive, a period of five years, covering a remarkable depression of all business, the receipts of the canals, from all sources, even with the drag of the lateral canals, have been sufficient to meet the cost of collection and superintendence, and all ordinary expenditures, and leave a surplus available for other purposes.

But with the added charges for *extraordinary* repairs, for interest on the canal debt, for payments (sinking fund) on the principal of such debt, and for a contribution, required by the constitution, of $200,000 annually for the support of the government, there has always been for each of the years under consideration, a large annual deficiency in the canal exchequer, which has had to be met by the appropriation of moneys raised by general taxation. And the amount actually raised by taxation, and appropriated to meet such deficiencies, during the four years from 1873 to 1876 inclusive, has been (according to report of the canal auditor for 1878), $9,393,603. It is pertinent, therefore, to consider next, in brief detail the nature of these additional charges, which have constituted in the past, as they do at present, the real burden of the canals upon the State.

Extraordinary Expenditures — And first we have always appearing the item of expenditures for extraordinary repairs. Let us inquire in what they consist. That they are extraordinary in amount needs no demonstration ; for the figures in the above table speak for themselves. In respect to character they are thus described by the State Engineer, in his annual report for 1876, p. 17. "Under this designation," he says, "it has been customary to class all unusual repairs to, and changes in the canals and their important structures. Provision for the cost of these works has heretofore

been made by special appropriation of funds raised by general taxation. All repairs necessary to maintain the canals in an efficient condition, should be classed as *ordinary repairs*, and paid out of the canal revenues; *which under an economical administration are, even now, ample for the purpose.* Large appropriations have, heretofore, been annually made for special local improvements not necessary for the purpose of navigation, nor adding in any degree to the efficiency of the canal system. The State is in no wise bound to provide for any such improvements. The expenditures for these purposes have been charged against the canals, and but for them, their present financial condition would be much more satisfactory than it now is. The expenses of such improvments should be borne by the communities or parties specially interested, and not by the State."

It is to be presumed that a person competent to be State Engineer for the State of New York knows whereof he speaks in his official reports, and speaks the truth. And if the statement in the above quotation from his report for 1876 (repeated in the report for 1877) is the truth, then it will be clearly the fault of the legislature and of the administration in charge of the canals if, under all ordinary circumstances, there is another dollar sunk hereafter in that extraordinary sink which has before swallowed up so much, namely *extraordinary expenditures.*

Canal debt and interest — The canal debt on the 30th of September, 1877, less all balances in sinking funds, was $8,630,016; on which a present annual interest accrues of $593,622.

Constitutional Obligations on the Canal Revenues — The constitution of the State of New York requires that from the annual surplus revenues of the canals, there shall be paid into the sinking fund for the extinguishment of the canal debt the sum of $450,000; and for the support of the State government, the further sum annually of $200,000, or a present annual total of $650,000. Including also so much of the interest on the canal debt as the constitution requires shall be paid from the surplus revenues of the canals in coin, the appropriation of surplus revenue of the canals annually required by the constitution was, for the fiscal year 1876-77, $1,227,210.84, with a similar impending charge on the canal revenues for the present fiscal year, 1877-78. But as the canals for the fiscal year 1876-77, after providing from the receipts for their use, for the expenses of their administration and for all *ordinary repairs*, showed a net revenue or surplus of only $3,031.33, the measure of their

inability to meet their constitutional obligations for the past fiscal year, was $1,224,179.51; with the added certainty that for the future no different fiscal results can be anticipated.

The Canal Provisions of the Constitution Abrogated by Natural Laws.

The provisions of the constitution of the State of New York in respect to the disposition of the surplus revenues of her canal system have, therefore, by a higher law, been abrogated; for no constitution or human law can enforce impossibilities, or direct the use and disposition of a surplus revenue from the canals, when practically no surplus revenue exists or is likely hereafter to be placed at the disposition of the State. For nothing, in the opinion of your commission, is more certain than that under no system of toll adjustment and canal management, suited to the times, can a revenue be expected from the canals that will more than suffice to maintain them in a good workable condition and defray the expenses of their administration. The people of the State of New York may, therefore, here and now, accept the conclusion that any existing debt standing charged to the canals and any interest on account of the same will not be paid from the earnings or revenues of the canals, and must be paid from the proceeds of general taxation. And it is difficult to see according to what principles of reason or equity the canal system of New York as it now exists can be held responsible for any existing debt or burden of interest on account of the same. There is no dispute that the Erie canal proper has from the first day it was opened for the transportation of commodities to the present hour been a profitable investment for the State. There is no question that the receipts from the use of the Erie canal have reimbursed to the State every dollar directly expended in its maintenance and construction, and have also more than supplied any deficiency of receipts arising out of the construction and maintenance of the Champlain and Oswego canals. And, as respects the general financial results of the entire canal system, the governor of the State, in his message, January, 1877, pp. 5–6, after pointing out that the canal debt on the 30th of September, 1877, was $10,081,660, and the balances in the sinking funds of the State at the same date, applicable to all debts, was $14,191,889, goes on to say:

"It must be observed, however, that the amount in the General Fund Debt Sinking Fund cannot all be applied to the payment of that debt without leaving a large deficiency of means for paying the current expenses of the government. The full amount required

for the payment of the debt was contributed from the surplus revenues of the canals, as directed by the constitution, the last contribution having been received in 1873. But, instead of being applied to that object, it was used to pay other appropriations made by the legislature, and not otherwise provided for, and has never been fully restored. The debt therefore remains uncanceled."

It is also pertinent to here ask attention to the remarks of the controller of the State and of the State engineer, in their respective reports for January, 1878, on the same topic:

"The constitution of the State," says the controller, "contemplates that the sinking funds established to provide for the payment of the canal debt shall be derived from the surplus revenues of the canals. Owing to the general stagnation in business and the consequent competition for the carrying trade by railroads the canals cannot earn a surplus. The Erie canal has been successful, far beyond the expectations and hopes of its projectors. For a long time it had the entire monopoly of the carrying trade, and the prosperity it gave to the sections of the State through which it ran created a demand for lateral canals. The cost of these laterals was made a charge upon the revenues of the Erie canal, which charge was only just so long as the Erie canal had a monopoly."

"When the legislature gave to the railroads the right to carry freight without the payment of tolls, it destroyed the power of the canal to meet these charges. By this act, which transferred so much business from the canal to the railroads, it practically abrogated the pledges of the constitution and made cheap transportation the policy of the State. In addition to the rivalry thus made by the State against its own canals by which they were shorn of their earning capacity to the extent of millions of dollars, it also instituted expenditures and kept them in repair under the contract system."

"Under this system the canals not only fell into such a state that navigation was very materially impeded, but they were robbed upon every hand."—*Report of the Controller of the State of New York, Jan.* 1878, *p.* 32.

"Had the sums," says the State engineer, "which have, in past years, been wasted on unnecessary works or stolen, been applied to the legitimate expenses of the canals, the debt would have long ago been paid, their banks and structures all placed in a permanent condition; and the possibility of even lower tolls than now established."—*Report State Engineer and Surveyor, Jan.* 1878, *p* 34.

When the inevitable becomes manifest, there is nothing left but to accept it and practice resignation. But it is easier to pass into the state of full resignation, if it can be felt that what has become imperative through force of uncontrolled circumstances, is exactly what would have happened had the conclusion been wholly determined on the basis of the principles of justice and expediency by those interested in the result. Such is the exact present relation of the people of the State of New York to any burden of obligation arising out of the existing canal debt and the necessity of paying interest thereon until the debt is discharged. The canals cannot pay this debt or this interest, for they neither have, nor are to have in the future, any surplus revennes over and above the cost of their administration and maintenance. The people, therefore, must discharge these obligation by taxes on their estates. But if the people had not allowed the revenues to be derived from their legitimate objects, and "used to pay other appropriations," or "wasted on unnecessary works or stolen," there would have been to-day no burden of canal debt or interest for the people to assume.

A summary of results derived from this analysis of the various elements entering into the canal finances would, therefore, be as follows:

There is, in the opinion of the State engineer, no necessity for any further canal expenditures on account of *extraordinary repairs.*

The principal and interest of any existing debt, charged to the canals, cannot be expected to be paid from the future resources of the canals. The same is true of the existing constitutional requirement, that there shall be paid from the surplus revenues of the canals the sum of $200,000 per annum toward the support of the State government.

New Work.—Enlargement, etc., opens up an independent question, the same in character as that presented when the canals were first projected, built and enlarged, which should be decided by the people of the State in the same way as any other business proposition which may be brought before them, *i. e.*, by determining whether the benefits to accrue from such expenditure are sufficient to warrant or justify it.

Prospective Future Receipts and Expenditures of the Canals.

The next and the most important questions that come up for consideration in connection with this investigation are:

What amount of (ordinary) annual expenditure must be in-

curred, and is essential to administer the canals and maintain them in a good workable condition; and by what system and rates of tolls can the largest revenue be obtained by the State for the use of the canals without impairing their ability to successfully compete with other and rival methods for the transportation of merchandise? The answer in general to the first of these questions is to be found in a provision of the State constitution; and to the second, in considerations of experience and expediency.

The provision of the constitution referred to, is to the effect, that the expenditures on account of the canals for collection, superintendence, ordinary and extraordinary repairs, shall not in any one year exceed in amount the gross revenues of the previous year. So long, therefore, as this constitutional provision remains in force (and should the people of the State desire to change or abrogate it; or even as proposed, abolish all tolls and make the canals free, the amendments necessary to effect such object could not, at the earliest, become operative before January 1, 1881), the canals of New York must depend on their current revenues to meet the cost of their present administration and maintenance. For, as the Auditor of the Canals has clearly pointed out in his last report (January, 1878), there is from this constitutional provision "no escape or practical method of circumvention;" and, furthermore, that it is not the revenues collected in any one year that are available for expenditures the succeeding year; but "every year's expenditures for maintenance are necessarily paid from the earnings of the same fiscal year." (*See letter of Auditor to the Speaker of the Assembly, January* 17, 1878.)

Now for the last two fiscal years—1875–76 and 1876–77—the expenditures on account of the canals for administration and repairs have averaged $1,162,707.19 per annum; and the Canal Auditor, upon carefully reviewing the whole subject, is of the opinion that a present annual expenditure of an equal amount, represents the minimum necessary to maintain the canals in good navigable condition, "secure proper attendance at the locks, and protect and collect the revenue." But for the fiscal year ending September 30, 1877, the earnings of the canals fell short of providing for such an expenditure, by the sum of $109,346.18; and for the current fiscal year, 1877–78, and under the existing rates of toll, there is no good reason to expect that the revenue will be any greater than for the immediate previous year. And if by any contingency the revenues of the canals for the current year were to be increased to the

amount. essential in the opinion of the auditor for their maintenance —$1,162,707.19—such an amount, under the restrictions of the constitution, could not, it would seem, be lawfully expended because it exceeds the gross revenues of the canals for the fiscal year 1876–77 by the sum of $109,346.18. It probably never entered into the minds of those who drafted and proposed the constitutional amendment restricting the annual expenditures on the canals, or of the people who ratified it by their votes, that the time ever could come when the New York canals would fail to earn sufficient to defray the cost of their administration and maintenance; but the unexpected (which it has been often remarked is the thing most likely to happen), now actually has happened; and confronts the canal board and the legislature of the State of New York, with a problem of the most serious character.

Assuming (as we are warranted in so doing), that the earnings of the canals for the current fiscal year, under the existing rates of toll, are not likely to prove sufficient to yield the sum, which the State Auditor, reasoning from the experience of recent years, is of the opinion it is necessary to expend for canal maintenance, what is to be done? The Auditor, himself, gives one answer, and the one that most readily suggests itself; namely, to forthwith "impose such rates of toll as will surely produce a revenue sufficient at least, to keep the canals in good repair, with a safe margin for such contingencies, as breaks and necessary extraordinary repairs." But this is evidently not a sufficient and satisfactory answer. "You may lead a horse to water but you cannot make him drink." You may arbitrarily impose any system or rates of toll that you please; but if such rates are of such a character as will enable the railroads to underbid the canals in the smallest degree in the matter of freight, as surely as water seeks the lowest level, so surely will the business of transportation leave the canals and go to the railroads, and the canals instead of earning as much or more than they now do, will inevitably earn less. It is true that the legislature of New York under the recent decision of the United States Supreme Court (Chicago Elevator cases), has free and unrestrained powers to determine what rates of freight, the railroads of the State competing with the canals shall establish and collect. But the authority of the legislature of New York is limited to its territorial jurisdiction; and to attempt to prescribe local railroad rates, which the competing lines of adjoining States exterior to the jurisdiction of New York would not conform to or recognize, would be to in-

volve State railroads and State canals alike, in one common destruction.

What is to be done in the case the canals during the current fiscal year, or indeed during any future year while the restrictive provision of the constitution is in force, fail to earn their current expenses? What, in case of the necessity for large and extraordinary expenditures contingent upon a break which is always liable to occur by reason of a freshet or some other non-anticipated and non-preventible agency, it is not for this commission to advise. But it is legitimate for them to point out, that it will not be wise for the canal board or the legislature to defer consideration and the making of provision for an emergency such as has been suggested until the presence of the emergency requires immediate action. Apart from this consideration, the immediate policy which the commission would advise in respect to the canals would be as follows:

First. To make all haste to amend or repeal the provision of the State constitution which inflexibly limits the amount that can under any circumstances be expended in any one year on the canals. It does not seem probable that this provision could ever have been adopted, if the existing circumstances could have been anticipated at the time of its adoption. So long as it remains in force, the canals are liable to be closed, or at least seriously embarrassed, at any moment during the business season of the year for want of the necessary funds to operate or repair them; thereby inevitably entailing losses on a business of transportation—that last year represented a movement of over five millions of tons and a value of about one hundred and fifty millions of dollars—in comparison with which the deficiency in the annual canal revenues of one or two hundred thousand dollars would be comparatively insignificant. Rather than that such a contingency should occur after the full tide of the season's work had been entered upon after contracts had been made, and after all the instrumentalities of movements had been placed in full equipment, it would seem to be better that the canals should not be opened at all.

Second. To determine in advance of the opening of the canals for the season of 1878 what amount of revenue, under a system of tolls that will allow of successful competition with the railroads, is reasonably certain to be earned by the canals for the current fiscal year; and then further determine that no efforts shall be spared by those in authority and trust to make such earnings and the year's expenditures fully correspond, trusting to the good fortune that intelligent supervision and foresight always go far to command,

that nothing extraordinary demanding unusual expenditure, will happen.

Judging from experience, it would seem as if under a system of tolls, no higher than prevailed during the past season, and which in the main were satisfactory to the forwarding interests, a revenue of over *eight hundred thousand* at least might safely be anticipated from the canal earnings for the year.

It is very true, as has already been pointed out, that the Canal Auditor, who with his associates are entitled to the highest credit for what they have accomplished in the way of economy in the canal administration during the years 1876 and 1877, is decided in his opinion that a considerably larger expenditure than eight hundred thousand dollars will be necessary to efficiently maintain and administer the canals for the present fiscal year. But it will not be discourteous to the Auditor to remind him that it is not easy to define the limits of the possible, especially in the presence and under the pressure of urgent necessity. Besides, the canals for the first time in their history will be placed during the present year under the supervision of one responsible head, in itself a guarantee of greater economy in management than has ever before been experienced. "All experience," says the Governor of the State in his recent message, "has shown that the navigation of the canals is not improved, but is actually damaged by large revenues, leading to wasteful, careless and corrupt expenditures. This is illustrated by the experience of the past season. The expenditures have been much lower than for many years previous, but in no one of them have the canals been in such complete order, and so free from breaks and interruptions to navigation. And yet the administration, during 1877, has been under the old cumbersome and expensive system. It is the opinion of many well-informed men that by placing the administration under one responsible head who will adopt a new system, cutting off all abuses, *the canals can be successfully managed for one-half the expenses incurred during the past year.* This expectation may be too sanguine and it will be imprudent to act upon it before it has been tried, but I trust it may be very nearly realized. The extraordinary and gratifying results which have been reached in the State prisons by the faithful and efficient supervision of one responsible head, give reason to hope for similar results under like management of the canals."

It is also a circumstance that it is well to bear in mind in this connection, that during the years when large expenditures were being constantly made on the canals, for so-called improvements or

extraordinary repairs, these very improvements or repairs constituted very serious obstructions to navigation.

By the adoption of the constitutional amendment in 1874, permission was given to the State authorities to sell or abandon all the canals owned by the State, except the Erie, the Champlain, the Oswego, and the Cayuga and Seneca. It would seem as if no further evidence could be needed of the wisdom of this amendment, or the expediency of action in accordance with the spirit and intent of the permission it embodies, at the earliest possible moment and to the greatest practical extent, than to re-exhibit the recent fiscal results of the operation of such of the canals as it has been proposed to discontinue.

Thus, for the fiscal year 1876, the earnings or revenues of these canals, which may also be taken as a measure of their business, were $32,567, and their cost (administration, ordinary and extraordinary repairs), $199,235. For the last fiscal year, 1877, their revenues were $40,530, and their total cost, $185,729.48. Could the constitutional canals be at once relieved from the further burden of the canals, which it is in the power of the legislature to discontinue, there could be little doubt that the canal revenues of the current year would be sufficient to meet the Auditor's estimates for the year's fiscal requirements; while to continue, at the demand of purely local and sectional interests, and at this crisis to saddle the main canals with the cost of maintaining laterals, which years of costly experience have demonstrated the folly of ever building; which no private interests could afford to take as a gift on condition of keeping in repair; which a period of the prescription of almost nominal rates for their use has abundantly proved, that to the people of the districts they traverse, these canals are not of sufficient importance to warrant any considerable using, is in effect to assert the expediency of providing for the little, at the expense, if not paralysis, of an interest that intimately concerns the prosperty of the whole State. Governor Tilden, in his message of January, 1875, also calls attention to a circumstance, now more pertinent than ever, that the late Mr. Flagg, who was so long and so usefully connected with the finances and canals of the State, always asserted, "That the four canals, (which the amended constitution retains) were all that were necessary to make the canal system of New York entirely complete."

It is also worth while in estimating to what extent the expendi tures for maintaining the canals can be reduced, to recur to the

testimony on this point, given by the State engineer in his annual report (made January, 1877), and reiterated with emphasis in his report submitted January, 1878. "Ordinary repairs," he says, "are executed by the superintendents, who, although appointed by the Canal Board, act, as a rule, under the sole directions of the Canal Commissioners."

"The State engineer having had occasion, while examining matters referred to him by the Canal Board, to scrutinize the expenditures for ordinary repairs, has become convinced that these expenditures have, in many instances, been largely in excess of the sums which, with economical and judicious management, would have been sufficient for the maintenance of the canals."

And again he states that "having had occasion to examine a large number of Superintendents' returns, he is convinced that the State has suffered and continues to suffer great loss, in the purchase of tools and materials, on account of the high and extravagant prices allowed. There is now no general system controlling these purchases; each superintendent trades independently with merchants of his own selection, and it often occurs that the prices allowed for precisely the same kind and quality of articles, on adjacent or neighboring sections, vary as much as fifty per centum."

"The purchase of tools and materials should be controlled by a general system, providing that they shall be made by a single or central authority, and by contract with the lowest bidder, or in some way that will secure the lowest prices."

"With the data at hand, there is no difficulty in making close estimates of the necessities of a season; and there is no doubt that, by adopting such a system, from forty to fifty per centum could be saved to the State on the purchases as now made. The purchases by the Superintendents now annually amount to about $200,000; and have in previous years amounted to nearly $300,000. As these purchases are now generally made, the State pays not the lowest market price, but the prices asked by the local merchants. Annual contracts could be made for the delivery of articles along the line of the canal when and where wanted, and sufficient supplies for daily use and emergencies could be kept stored in the various State shops. Whatever system is pursued in making these purchases, great improvement is clearly necessary in this branch of canal management."

"Attention is also called to the manner of making repairs to the *structures* of the canals. It has often occurred that extensive repairs, requiring careful engineering supervision, have been carried

on without consultation with the engineer department. In order to secure safe, durable and cheap work, it should be *provided by law* that no repairs to any structure on the canals shall be made without the supervision of an Engineer."

During the fiscal year 1876, the reduction on the cost of *ordinary* repairs (See Engineer's Report, 1878, p. 8), amounted to $149,438. As compared with expenditures for similar purposes during the previous fiscal year, and during the last fiscal year, 1877, a further reduction under the same head was effected of $172,989. And the Engineer, in calling attention to these facts, expresses the opinion, that if reforms, of the character and in respect to the things he indicates, can now be instituted; that there is an opportunity for the further saving of "at least $150,000" per annum in the expenditures for canal repairs, over and above the great reductions which were made in 1876 and 1877. But it was for the accomplishment of this and other similar objects, that the office of Superintendent of Public Works has been created and a competent person appointed to fill it; and until it has been proved to the contrary, there is no good reason to doubt, that all that has been anticipated from the measure will be realized, and that under the present incumbent, the further sum which the State Engineer declares can be saved in canal expenditures, and even more, will be saved.

Canal Bridges.

Again, no one can examine the detail of the expenditures on the canals without being struck with the amounts annually appropriated for the construction and repair of bridges. In very many cases the construction of the canal invaded no prior rights of free communication between the territory which it traverses that were of any material value; and any subsequent necessity for bridges—as, for example, where centers of population, more or less extensive, have subsequently come to exist along the line of the canals — has resulted, not by reason of any conditions originally created by the canals, but because t' e increased value and use which the construction of the canals gave to adjacent private property, created necessities for the construction of bridges in order that the value and use of such private property might be further increased. In all equity, therefore, in all such cases, the population would seem bound to accommodate itself to the necessities of the canals, and not the canals to the necessities of a population, grouped under the name of a village, town or portion of a city, which would not probably exist at all

had not the canal been previously constructed. The Commissioner would therefore recommend, that except where contract or stipulation has been made to the contrary at the time of the original construction or enlargement of the canals, the several towns or cities traversed by the canals be hereafter required to construct and keep in repair the bridges crossing the canals, in the same manner as the same towns and cities are now required to construct and keep in repair the bridges necessary or convenient for crossing the natural water courses, or ravines by which these territories may be intersected.

In view of these facts and considerations, the Commission feel warranted in assuming, that an annual revenue of about eight hundred thousand dollars, or as much at least as has been derived from the use of the canals during the season of 1877, under the reduced system of tolls, will suffice, especially under the new system of centralized superintendence, to keep the canals in a good workable condition—extraordinary contingencies excepted—and also pay the expenses of their administration. But whether they are or are not warranted in their assumption, this one fact has got to be steadily kept in view; that for the next three years, the measure of the amount that can be expended on the canals in any one year, is the gross revenue earned during the preceding year; and that under a system or rates of toll, warranted by expediency, such earnings will be limited some eight hundred or nine hundred thousand dollars. It is not, therefore, under the circumstances, a question whether the cloth shall be cut according to the pattern. It has got to be!

We are thus brought logically to the one immediate and important question before this legislature of the State, the Canal Board and this Commission, namely, by what system, or rules of toll, shall such a revenue as the canals are able to yield and live in competition with the railroads, be collected. But before proceeding to the discussion of this question, it is important to first obtain a clear idea of the service of the canals; *what it has been; what it is; and what may be expected in the future.*

The Service of the Canals; Past, Present and Future.

Concerning the immense service which the Erie canal has rendered to the State and the country, there can be no dispute. The original motive of its construction was undoubtedly in the main to supply the needs of the State; but it soon became apparent that its mission was to be far more important.

At the time of its construction and for many years subsequently, it was practically the only avenue for transportation of freight between all that extensive area of fertile territory bordering on or adjacent to the great lakes, and the eastern Atlantic States and seaboard. In fact, until about the year 1856, "almost all the surplus grain produced in the Western States was transported to Eastern markets by the lakes and the Erie canal, and to the Southern markets by the Mississippi and its tributaries; New York being the almost sole distributing point at the East, and New Orleans at the South." Without the Erie canal, the growth of all the States north of the Ohio and east of the Mississippi would have been greatly retarded. With an avenue, ready, cheap and convenient to the Eastern markets and seaboard, once opened to them by the construction of the canal, the growth of these same States in population and wealth was exceedingly rapid and as if magical; and this growth in turn as rapidly increased the volume of business of the canals.

Thus, in 1836, of the total tonnage of property arriving at tide-water by way of the *Erie canal*, the State of New York furnished 364,907 tons, and the Western States, in the aggregate, but 54,219 tons. In 1846 the proportions were 600,440 tons, New York, and 506,830 from the West; in 1856, 374,580, New York, and 1,212,550, West; in 1866, 287,948, New York, and 2,235,716, West; and in 1876, 342,552, New York, and 1,402,768, West.

The tonnage of agricultural produce arriving at tide-water by way of the Erie canal, in 1836, was 165,870, of which 117,870 tons were credited as the produce of New York, and only 48,000 tons as coming from the entire west and Canada. But, from this time, the aggregate of this class of tonnage increased with great regularity and rapidity, until the year 1863, when the total became 1,899,911 tons, with this very noticeable reversal of proportions; 1,676,480 tons being credited for that year to the Western States and Canada, and only 133,431 as derived from New York. Since the year 1863, the movement of this description of tonnage on the canals to tide-water has declined; but not to a very marked extent as to the products of the Western States until 1875; but so notably in respect to agricultural tonnage the product of New York, that for the years 1875 and 1876, the latter has been comparatively almost nothing; the proportions for 1874 being 1,400,993 tons Western States and Canada, to 25,051 tons New York; 1875, 1,130,156 west, to 3,466 New York; and in 1876, 875,079 west, to 7,312 New York. In 1876 the aggregate tonnage of all agricul-

tural products arriving at tide-water, by all the canals, was 906,483, showing a decline in 13 years of over *fifty* per cent; and this in the face of an immense general increase in the movement of agricultural produce passing from the West to the Eastern States and sea-board. For the fiscal year 1876–77, the total movement of this class of tonnage on the canals, under the influence of large crops and reduced tolls, at once increased from 1,067,497 tons, to 1,515,600 tons.

Of the products of the forest—timber, staves, fire-wood, ashes, etc.—the tonnage which moved to tide-water by the Erie canal in 1836, was returned at 214179 tons, of which 208,779 appears as the product of New York and 5,400 tons as the product of the West and Canada. This movement culminated in 1870, when the aggregate was 946,139 tons, of which 937,799 was apportioned as coming from the West, and only 18,340 as the product of New York. In 1876, the aggregate movement of this description of tonnage to tide-water, by the Erie canal, was reduced to 570,755 tons; of which 76,760 tons was credited to the State of New York for its origin. Including the Champlain canal, the movement of forest products to tide-water, by all the canals, which was 473,663 tons in 1836, culminated in 1870 with a movement of 1,465,517 tons; from which figure it ran down to 890,725 tons in 1876. The total movement on all the canals of this description of tonnage, which was 1,175 313 tons in 1876, increased to 1,384,454 tons in 1877. Of manufactures—spirits, pig and bar iron, salt, furniture, etc.—the aggregate movement to tide-water by the Erie canal in 1836 was only 10,806 tons, of which 10,152 was returned as derived from the State of New York, and 654 tons from the West. This movement culminated in 1870, with a total tonnage of this description arriving at tide-water, of 72,345, of which 68,722 was from New York, and 3,794 from the West. For 1876, the aggregate movement of this class of manufactures to tide-water by the Erie canal, was 17,510 tons; by all of the canals, 44,268 tons; of which 151 tons was returned as from the West.

Of merchandise—sugar, molasses, coffee, railroad iron, crockery, etc.,—the total movement going from tide water, by all the canals, in 1836, was 117,886 tons, of which 73,832 tons was left in the State, and 43,058 passed out of the State; 38,893 tons going West. This movement culminated in 1853, when the aggregate of this description of tonnage going from tide-water by the Erie canal was 396,684 tons; and by all the canals, 426,404, of which 154,422 tons were left in the State, and 274,927 passed out of the State; 231,-879 going west. For 1876, the aggregate movement of this class

of freight, by all the canals, from tide-water, was 48,542; of which 28,769 tons were left in the State, and 19,723 passed out of the State; 6,063 tons west.

The striking results of this analysis is the showing of how gradually the main object for which the canals were originally projected and constructed, namely: the supplying of the wants of the State, has ceased to be the object; and how small a proportion of the business of the canals now originates in the State of New York.

A summary of the service performed by all the canals from 1837 (the earliest date for which reliable figures seem accessible), to 1877, gives the following results:

The total movement of property of all kinds on all the canals for the year 1837 was 1,171,296 tons, having an estimated and returned value of $55,809,000. From this time this business of transportation increased with great regularity. It was 2,869,810 tons, having a value of $151,663,000 in 1847; 3,344,000 tons, with a value of $136,997,000 in 1857; and 5,688,000 tons, with a value of $278,966,000 in 1867. The movement of the canals attained its greatest proportions during the period from 1868 to 1874, inclusive; in the respective years of which period the aggregate tonnage transported and its returned value was as follows:

Year.	Tons.	Value.
1868	6,442,225	$305,301,000
1869	5,859,080	249,281,000
1870	6,173,769	231,836,000
1871	6,467,880	238,767,000
1872	6,673,370	220,913,000
1873	6,364,782	191,715,000
1874	5,804,588	196,674,000

The largest amount of tolls collected in any one year for the use of the canals was in 1862, namely, $5,188,943, on a tonnage movement of 5,598,785. It was $4,246,000 in 1868; $3,072,000 in 1872; $2,637,000 in 1874; $1,340,000 in 1876, and $1,041,690 in 1877 (fiscal year), a smaller amount than was collected in any one year since 1836.

The largest number of boats, irrespective of tonnage, built and registered in any one year, was in 1847, namely, 1,446. The largest amount of new tonnage put on the canals in any one year was in 1862, namely, 142,470. After that the amount of new tonnage put in the canals fluctuated greatly; 28,795 in 1865; 80,360 in 1867; 29,225 in 1871; 79,740 in 1873; 45,760 in 1874; 10,825 in 1876.

Period of Greatest Usefulness of the Canals.

From this analysis it appears that the period of greatest usefulness of the New York canals, measured by the amount of property transported, was during the years from 1868 to 1874, inclusive, during which time there was no very marked change in the amount of business transacted. The year 1874, however, marks the inception of a period of decline, as will appear from the following table:

Years.	Tonnage movement.	Tolls collected.	No. of boats built.	Movement of boats in miles.
1873.....	6,364,782	$2,976,718	433	9,485,450
1874.....	5,804,588	2,637,071	249	8,010,615
1875.....	4,859,858	1,590,032	102	6,621,175
1876.....	4,172,129	1,340,004	75	5,830,775

The year 1876 was one unfavorable alike to railroads, as well as canals. The wheat crop of the country was below the average, and other crops were not notable for either quantity or quality. Business of every description was depressed and paralyzed—the result, remotely, of a tremendous war and enormous expenditures, and, proximately, of reaction from a period of almost unprecedented inflation in the wages of labor and the prices of commodities. And yet, during this year the tonnage conveyed on the New York system of canals (4,172,129) was equivalent to more than one third of all the tonnage engaged in foreign trade which entered into all the ports of the United States during the same year (12,510,748), and nearly equal to the aggregate tonnage of all American and foreign vessels which entered the port of New York from all foreign countries during the same period, namely, 4,467,139.

Effect of Railroad Competition on the Canals.

But whatever may be the extent of the diminution of business experienced during recent years by the canals, there can be no doubt as to the principal cause of such diminution. It is due mainly, if not entirely, to the competition of the railroads. This competition showed itself first in the withdrawal from the canals of the passenger business. In 1837 the Erie canal was practically the only avenue for the transportation of passengers and merchandise between the northwest and the eastern Atlantic States and sea-board. As late as 1848 the mileage of packet boats on the canals was 542,300 miles; in 1875 it was 2,725 miles. Then all those commodities requiring rapid transportation, "express goods,"

were soon transferred from the canals to the railroads; and gradually, manufactured goods, and the large class of freights, known as "general merchandise," ceased to form any considerable part of the canal traffic, and were in turn transferred to the railroads. Comparing the results of the canal business in 1861 and in 1873, we have the following results:

The transportation of flour fell off from 2,012,574 barrels in 1864, to 751,870 barrels in 1866, and to 181,731 barrels in 1873, a decline of about 90 per cent. In 1876 but 81,019 barrels of flour were moved on all the New York canals. Wheat fell off from 33,171,900 bushels in 1861, to 26,766,000 in 1873, and 13,879,000 in 1876. Butter, from 2,605 tons in 1861, to 590 tons in 1866, and 10 tons in 1873. Cheese, from 2,605 tons in 1861, to 426 tons in 1873. Dried fruit, from 1,810,000 lbs. in 1861, to 131,000 lbs. in 1873. Coffee, from 4,892,000 lbs. in 1861, to 142,000 lbs. in 1876.

On the other hand, the 947,733 bushels of potatoes transported on the canals in 1861, increased to 1,356,000 bushels in 1873, and 1,333,933 in 1876. Coal increased from 635,720 tons in 1862 to 1,625,859 in 1873. Iron ore, 138,117 in 1862, was 415,968 in 1873; and stone, lime and clay from 115,600 in 1862 to 415,000 in 1873. Boards and scantling, 592,274 tons in 1861, were 1,300,000 tons in 1873.

After 1873 the depression in business affected the demand for so many articles, and railroad rates were so much reduced, that the specific movement of freights on the canals seemed to be governed by no rule; while the aggregate freight movement was constantly on the decline. Comparing the fiscal year of 1876 with that of 1873, the decrease in canal tonnage was 2,192,553, and in revenue, $1,636,725. Comparing the fiscal year of 1876 with that of 1875, the decrease in canal tonnage was 687,729, and in revenue, $250,028. The results of the freight movement on the New York Central and Erie railways for 1876 as compared with 1875 showed on the contrary a gain for the season of 534,598 tons.

The following table shows the amount of tonnage transported on the New York canals, and on the New York Central and Erie railroads, from 1873 to 1876 inclusive:

Year.	Canals.	N. Y. Central.	Erie R. R.
1873.....	6,364,782 Tons	5,522,724 Tons	6,312,702 Tons
1874.....	5,804,588 "	6,114,678 "	6,364,276 "
1875.....	4,859,858 "	6,001,954 "	6,239,946 "
1876.....	4,172,129 "	6,803,680 "	5,972,818 "

For the year 1876 the total tonnage transported on the two railroads above mentioned was 12,776,498; the total tonnage moved on railroads and canals together, 16,948,627 tons. The canal, therefore, for the year 1876 moved 60.13 per cent as much as the New York Central railroad, and 69.8 as much as the Erie railroad, or 24.5 per cent of the business of the railroads and canals combined. The aggregate of the tonnage moved on the New York canals, New York Central, Erie, and Pennsylvania railroads for 1876 was 28,872,338 tons; of this the New York canals moved 4,172,129 tons, or less than one-sixth.

In reasoning, now, about this marked change in the movement of freights from the canals to the railroads, which has occurred of late years, and has proved so disastrous to the canals, this point should not be lost sight of, and that is; that the change is not a special one, confined or restricted to the canals, but is general, affecting all water-ways, rivers, the lakes, and the ocean coastwise, as well as the canals, and constituting a marked feature in the recent history of the entire internal commerce of the country. Thus, twenty years ago the commerce of St. Louis was almost exclusively confined to the Mississippi and its tributaries, and "the merchants of that city hardly regarded railroads as commercial highways." But in 1875 only 22 per cent of the commerce of St. Louis was by river, and the remaining 78 per cent was by rail.

An analysis of the movement of wheat, flour and corn from Chicago to the East since and including 1863, also gives the following results: In 1863, out of 10,736,000 bushels of wheat sent East from Chicago the railroads took but 89,861 bushels, or less than *one* per cent. In 1875, out of 22,017,000 bushels, the railroads conveyed 5,956,000, and in 1876, out of 12,775,000 they took 5,378,000 bushels. For the four years, 1873 to 1876 inclusive, when there were no unusual obstacles interfering with the commerce and use of the lakes, the increase of rail shipments was more rapid than in any former period.

But this change in the methods of transportation under discus-

sion, exhibits itself more conspicuously when we confine the inquiry to an article like wheat flour in barrels, where the value of the thing is considerable, as compared with its weight, or bulk. Thus, out of a total of 1,519,000 barrels of flour shipped East from Chicago in 1863, the railroads conveyed only 311,884 barrels ; but in 1876, out of a total movement of 2,545,121, the railroads took 2,309,580 ; or to state the case differently, it appears that while the shipments of flour from Chicago by the lakes during the year 1876 were only about *one-sixth* of the shipments by the same avenues in 1863, the movements of flour by rail East from Chicago in 1876, were about *eight* times greater than the movements of the same commodity by rail in 1863.

In respect to corn — a commodity of lesser value — it appears that while there has been a very marked increase in the shipments by rail from Chicago, *i. e.*, from 25,000,000 bushels in 1863, to 45,000,000 bushels in 1876, the shipments by lake have not exhibited any marked decrease; 24,749,000 bushels in 1873; 21,850,000 in 1875, and 28,000,000 in 1876.

Again, but a comparatively few years since, the principal part of the western grain consumed in the New England states, was brought by the canal and the Hudson river to New York city, and from thence distributed by means of vessels sailing coastwise, or by railroads to various points in New England. The bridging of the Hudson River at Albany, by which a direct rail-movement from the West to all points of New England was made easy, of itself, however, created a revolution in the methods of western grain distribution for New England, analogous, on a small scale, to the revolution in Indo-European commerce which occurred when the opening of the Suez canal in 1869-70, obviated the necessity for long voyages to India by sailing vessels *via.* the cape of Good Hope. Other agencies, as improved terminal railroad facilities, subsequently assisted in this work of changing the methods of grain supply and distribution for New England, the gradual course and present results of which are strikingly illustrated by the following table, presented in the report of the Massachusetts railroad commissioners for 1877;

Receipts of Flour and Grain at Boston from the West by Water and Rail from 1868 to 1877, inclusive.

FLOUR, IN BARRELS.

	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
By rail	733,955	818,827	995,950	1,052,042	988,491	1,282,429	1,303,851	1,230,137	1,342,191	1,463,492
By water	701,727	506,458	658,714	569,303	493,258	534,990	502,021	395,994	293,066	239,581

CORN, BUSHELS.

By rail	483,875	1,384,284	1,370,421	3,156,800	5,119,749	3,159,198	2,768,382	4,914,007	7,933,644	7,931,178
By water	1,847,159	1,055,676	945,981	481,303	320,755	304,867	219,394	148,277	66,059	88,767

OATS, BUSHELS.

By rail	606,033	1,076,675	1,676,108	2,244,086	2,384,699	3,245,016	2,885,812	2,499,631	2,718,574	3,149,881
By water	656,037	338,756	423,853	179,807	82,767	35,732	36,967	196,089	8,596	20,092

It appears from the foregoing table that the direct rail receipts of flour at Boston increased from 733,955 barrels in 1868 to 1,463,492 barrels in 1877, and that the receipts by water fell from 701,727 barrels in 1868 to 239,581 barrels in 1877.

The change in the mode of transporting corn was even more marked. The direct rail receipts rose from 483,875 bushels in 1868 to 7,931,178 bushels in 1877, while the receipts by water fell from 1,847,159 bushels in 1868 to 66,059 bushels in 1876, increasing to 88,767 in 1877.

It is customary to say that this very curious and important diversion of transportation from the water-ways to the railroads—a change which a comparatively few years ago would have been regarded as impossible to have occurred to any great extent—is due to the competition of railways. Analyzed, however, the expression means just this: that the railways have been able to do the work of transportation cheaper, by charging less directly as freight; or through improved facilities for loading and unloading, and by the avoidance of transfer charges from lake vessel to canal boat, and from canal boats to railroads for interior distribution, they have enabled the consumer to save sufficient to induce him to pay them higher freights than are charged directly on the lakes and canals, and still be the gainer in respect to his pocket. This is the plain, bald fact. It is a fact, moreover, against which it is no use for a community to contend, and any community that knows its own interest never will contend in the sense of attempting to resist the process of cheapening. For he that will sell cheapest, quality being taken into consideration, takes the market. He that will transport freight cheapest is going in the future, as he has in the past, to take the transporta-

tion. There may be and there has been interference by legislation to prevent dealers and freighters from charging too much; there never will be any well-considered movement to prevent people from charging too little for permanently and voluntarily rendering service of any kind. The law of the survival of the fittest applies as well in the economic world as in the animal and vegetable kingdom; and the canals, if they are to live, have got to perform service as advantageously as the agencies against which they compete. If they cannot comply with this condition, they must either pass out of the sphere of competition, or be aided artifically and abnormally to accomplish what they cannot do naturally and normally. Whether the canals, under better management and lower and simpler rates of toll for their use, can be made self-supporting in the future? or whether in order to enable them to continue to render the service for which they were constructed, their expenses for maintenance and administration must be defrayed, in all or in part, from the treasury of the State, which, in turn, has never any thing in it except what has been previously taken in the form of taxes from the people, are two separate and distinct questions. To aid, however, in the formation of an intelligent opinion in respect to the first question, it is desirable to pursue still further the analysis of the competition, under the influence of which the business of the canal has recently been interfered with and diminished, and learn, if possible, in what manner such competition has specifically acted.

And, in examining the comparative and average rates of toll, or freight charged for a series of years — *i. e.*, from 1870 to 1876, inclusive — by the railroads (New York Central and Erie) and the canal, respectively, for moving a ton of freight per mile, this fact first strikes attention, namely: that the canal always nominally performs its services at a very much smaller charge than is made by the railroads for performing a similar service. Thus, for example, service in moving freight was performed by the canal in 1870, 49 per cent cheaper than was performed by the railroads; 35 per cent cheaper in 1871; 36 per cent cheaper in 1872; 46½ per cent cheaper in 1875; and 37 per cent cheaper in 1876, the year of greatest depression in the business and revenues of the canals. The evidence on which these statements are based will appear from the following table:

YEARS.	Average frei't by rail, per ton, per mile.	Average frei't and tolls by canal, per ton, per mile.	Tons transported by rail.	Tons transported by canal	Comparative percentage. Cheapness of canals.
1870.....	1.61 cents.	0.83 cents.	1,667,950,495	904,351,572	49 per cent.
1871.....	1.56 "	1.02 "	1,755,774,593	1,050,104,125	35 "
1872.....	1.60 "	1.02 "	1,971,617,787	1,048,575,911	36 "
1873.....	1.51 "	0.88 "	2,279,636,872	1,057,711,089	42 "
1874..... ...	1.43 "	0.73 "	2,438,980,945	938,774,141	49 "
1875.....	1.24 "	0.66 "	2,417,626,079	727,597,369	46½ "
1876.....	1.06 "	0.68 "	2,711,878,976	570,969,064	36 "

Reasoning from the basis of these figures, which are furnished by the Auditor of the State in his report for 1877, it would seem as though, making all due allowance for the saving in time and saving in expense, by reason of greater terminal facilities on the part of the railroads, that the railroads had more to fear from the competition of the canals than the canals from the railroads. But when it comes down to a comparison of the respective charges for performing a specific work for which the railroads and canals especially compete—as for the carriage of a bushel of wheat or corn—the results are quite different. Thus, for example, the average freight charges for carrying a bushel of wheat or corn on the canals and Hudson river (including tolls), and on the New York Central and Erie railroads (from Buffalo to New York) for the year 1876, were as follows:

	WHEAT per bushel of 60 lbs. c. m. cent.	CORN per bushel of 56 lbs. c. m. cent.
Canal.....	6 7 2	6 0 9
Rail.....	6 7 1	6 1 3

Of the above canal rates, 02.07 cents were the tolls on a bushel of wheat; and 01.93 the tolls on a bushel of corn from Buffalo to Troy, the head of tide water.

It would not seem to be necessary to present any additional array of figures to make clear the position. For the year 1876, for example, the railroads (New York Central and Erie), bid against the canal and against each other for the movement of the great staple articles, from the tolls on the transportation of which, the canals have heretofore mainly derived their revenues; and the railroads did their work as respects the transportation of vegetable food, as cheaply or more cheaply, than the canals. For the year 1875, the average freight paid upon grain moved by rail from the West to the seaboard was returned at thirty cents per bushel, and for 1876, at twelve cents per bushel. The result was that out of an aggregate movement of vegetable food on the New York railroads and

canals for the year 1876, of 3,939,000 tons, the railroads took 2,875,000 tons, and the canals 1,064,000; the railroads competing against each other for the grain movement East for that year, experiencing at the same time a loss of about $5,600,000 on their gross receipts as compared with their receipts for the previous year. The wonder is, that with nearly equal freight charges on the New York railroads and the canals for that year—to which the railroad added advantages in the great reduction of transit time,—the canals should have done any business at all.

But notwithstanding this most unfavorable exhibit so far as figures and results are concerned, there is a *per contra* in favor of the canals, which is eminently worthy of attention. Thus in 1837, when the Erie canal was absolutely the only practical avenue for the transportation of commodities between the Northwest and the Eastern Atlantic States and seaboard, the total tonnage moved on the canal was 1,171,296 tons, with a returned value of $55,809,000. On the other hand, in 1876, with four great railroads as competitors for the service which this canal had once performed exclusively —the New York Central, Erie, Pennsylvania Central and Baltimore and Ohio—and all of them successfully diverting immense freights from the canals, the aggregate tonnage transported on the canals was 4,172,129 tons, or nearly four times as great as in 1837, and in value $113,090,372 or more than twice as much as in 1837.

If the business of the canals has not increased in proportion to the increased experienced by the railroads, it must be remembered that a very large proportion of the business of the railroads has been created by the stimulus given to traffic by the new facilities which the railroads offered; business in large proportion which it is not likely the canals would ever have obtained under any circumstances. And in illustration of this, attention is asked to the fact, that the business which the railroads at the outset most interfered with, was the transportation of passengers and merchandise on ordinary roads by horses; and to such an extent, that it was predicted that there must be a great reduction in the value of horses by reason of their certain considerable disuse. And yet the adjuncts of railway traffic which came in as soon as the railways were established, have been so great, that the use and value of horses in place of being diminished, have greatly increased.

The year 1876, furthermore, was an exceptional year. It is acknowledged, that however it may be in the future, by reason of future railroad improvements, the rates charged by the railroads in that year for the movement of the freight for which the canals

competed were ruinously unprofitable to the railroads. The annual report of the Baltimore and Ohio railroad covering the business of 1876 states, that the freight rates were so low on certain classes of merchandise "as to cause absolute losses;" and that during a portion of the year this company actually declined to carry freights that were not only not remunerative, but which did not pay the actual expenses connected with the shipments. Yet, even under all these discouraging circumstances, the canals earned a sum for that year ($1,477,332 tolls), which all agree is now more than will probably suffice ($1,162,707, Auditor's estimate) to meet the necessary and ordinary expenditures for the current fiscal year. It will be, therefore, rash to assert that the New York canals, by reason of the swifter methods of railway transportation, have outlived their usefulness. So long as the bulk of eastern-bound freights to the seaboard consists mainly of grain, vegetables and lumber, and the western-bound freight is largely made up of coal, machinery, salt and other bulky commodities, the canal avenue, it would seem, must for many years to come remain a very important and serviceable highway for traffic. The change in recent years in the business that centers at St. Louis, from the water-ways to the rail, has been already pointed out; and yet, at the same time, it is the opinion of those in St. Louis most competent to form a judgment on this subject, that while the bulk of the commerce of that city is now transacted by rail, the railroads, nevertheless, do not prove themselves able to compete with the Mississippi river as a highway for the transportation of heavy and bulky freights, such as grain, hay, ores, tobacco, etc.

Recent European Canal Experience.

As bearing on the question whether the system of the transportation of merchandise on canals has become obsolete, and is likely to be entirely superseded by the service of railways, a brief notice of the recent canal experience of Europe will be pertinent and interesting.

Although the mainland area of Great Britain (84,392 square miles) is less than twice the area of the State of New York (45,658 square miles, exclusive of any share in the great lakes); and although railway service in Great Britain has been developed in proportion to area of territory to a far greater extent than in the United States (there having been one mile of railroad to every 5½ square miles of territory in Great Britain in 1872, and one mile of railroad to every 8 6-10 square miles in New York in 1874–5); the

movement of commodities on the canals of Great Britain is at present reported as in excess of 23,000,000 tons per annum, and the length of inland navigable water-way, still nominally or partially open for traffic, at 4,138 miles. It is not to be denied, however, that the canal system of Great Britain is not in a healthy or flourishing condition; but this is a result attributable almost entirely to the active hostility of the railway interest. At the outset the canal companies (all private and not national) endeavored to arrest the growth and development of the railways; and, in turn, the policy of the railways, as soon as they came into corporate existence, was to impede and ruin the canals. "The measures adopted for this end were of different kinds, but the policy was everywhere the same. In some cases the railway companies either bought or leased for long periods the navigable waters which appeared most likely to interfere with their monopoly. No less than 1,716 miles of inland navigation, out of a total of 4,138, are at this time under the absolute control of railway companies."

Thus the London and Northwestern, and Lancashire and Yorkshire railway companies are understood to pay yearly to the Leeds and Liverpool canal about £40,000 ($200,000), on condition that the canal will maintain a certain maximum tariff on the transportation of commodities. The formerly important route from London to Bristol has been substantially closed by the purchase by the Great Western railway of the Kennet and Avon canal; while the purchase of the Birmingham, the Worcester and Birmingham, and the Stratford and Wolverhampton canals by competing railways have closed the line of water-carriage between Liverpool and Derby, Birmingham and Gloucester. By these and other purchases and combinations, the British railway companies have grasped the "keys of the whole inland water-borne traffic" of Great Britain, controling, to a certain extent, even the famous Bridgewater canal, that early triumph of English engineering, which, in 1864, carried 2,237,891 tons, at a mean price of a shilling (English), per ton. "It would be an affront now to common sense," says a recent English writer,* "to maintain that so costly and combined efforts to close the gates of the inland navigation of this country" (Great Britain) "would have been made by the railway companies, had they not been aware that the canals were natural competitors for a portion of their traffic." Attention may be also here called to the circumstance, that on the Delaware and Raritan canal, of New Jersey

* Our Inland Transportation. Frazer's Magazine, April, 1877.

the experience since it came under the control of the competing railways, has been similar to that of the English canals under similar circumstances. The length of the Delaware and Raritan canal is 43 miles, and on it a toll-schedule ranging from 8 mills per ton per mile for fourth-class freight, comprising grain, lumber, etc., to 2 cents and 8 mills per ton per mile for first-class freight, has been established.

In Belgium, where the State has a direct interest and ownership in railroads, the canals are neglected and discouraged in order to concentrate the traffic upon the railways ; while at the same time, the State railways are acknowledged to be unprofitable, mainly by the reason of the low rates of freights officially established, and inefficiency in State management, as compared with private management. In France, on the other hand, the system of canal transportation finds favor ; the canals, in the transportation of heavy and bulky articles, successfully compete with the railroads ; and the business transacted upon them is reported as increasing. Reviewing the results of the operations of the French canals for the year 1875, the (Paris) *Union Nationale* says :

"Our internal navigation is still vital enough to effect a saving to trade of 56,000,000 francs. The canals and rivers transported during 1875, 1,721,000,000 tons of goods at the small cost of 4,177,940 francs. If these 1,721 millions of tons had gone by rail the charge would have been some 56,000,000 francs in addition."

In Germany, in place of abandonment, a large development of the system of canal transportation is actually in progress, or projected with a view of early undertaking and completion ; and a map has recently been published in Berlin by the veteran geographer, Petermann, showing that when the projected German canal system is completed, no part of Europe will possess facilities for cheap transportation at all comparable with those of the German Empire. A society has also been recently formed in Berlin to promote and favor the construction of canals ; and among the new and important German canals in the actual process of construction are two, intended to establish closed water communication between Berlin, the capital, and the Baltic, and terminating respectively on the coasts of Mecklenberg and Pomerania, and all this in face of the fact that Germany has at the present time a large and well-managed system of railway service, traversing the whole empire. Canal transportation is also being used, with increasing success, and under rates that defy competition, even in that land of low prices — India — the

entire cost of transporting merchandise upon the Madras canal being reported as not in excess of one-eighth of a penny per mile.

As also bearing on the subject it is interesting to note that the English authorities, who assume to be conversant with the internal economic affairs of Russia, assert that one of the great mistakes recently made by the government of that country has been to attempt to supersede her large inland water-ways — canals and rivers — by the construction of parallel or competing railroads. The former have always paid, and still command the largest share of the transport of the domestic business — and especially of grain. The latter are mainly unprofitable; the total net return of all the Russian railways being estimated as not in excess of 2½ on the capital actually invested in them.

The Season of 1877 and the System of Low Tolls.

With a view of guarding against future railroad competition, and in order to arrest what seemed to be, and actually was, a disastrous transferance of business from the canals to the railroads, the Canal Board in the spring of 1877, prior to the opening of navigation, and with the consent of the legislature, reduced the rate of tolls on the *principal* articles transported on the canals to the extent of fifty per cent or more, as per example:

	1876.	1877.
Wheat	1 mill per 1,000 lbs. per mile.	½ mill per 1,000 lbs. per mile.
Corn	1 " " " " " "	½ " " " " " "
Beans	1½ " " " " " "	½ " " " " " "
Barley	1 " " " " " "	½ " " " " " "
Coal	½ " " " " " "	¼ " " " " " "
Iron ore	½ " " " " " "	¼ " " " " " "
Lumber (white pine)	3 mills per 1,000 ft. per mile.	1-5 mill per 1,000 ft. per mile.
Salt (domestic)	1 mill per 1,000 lbs. per mile.	½ mill per 1,000 lbs. per mile.
" (foreign)	2½ " " " " " "	No reduction.
Potatoes	1 " " " " " "	" "
Stone	½ " " " " " "	" "
Shingles		" "

Twenty-three articles, from which little or no revenue (tolls) was derived, were placed upon the free list All up freights, except foreign salt, were reduced *fifty per cent.* The largest abatement in any one single item of tolls was in respect to the toll levied upon boats used for canal transportation; the revenue collected under this head for 1876 having been $116,791. For the years immediately preceding 1876, the annual revenues from the same source were as follows: 1875, $132,497; 1874, 160,885; 1873, $189,000.

It is curious to here note how little revenue accrued to the canals

under the system of tolls in 1876 from certain articles, which, under the new arrangement of 1877, were placed on the free list. Thus, the total revenue accruing from the transportation on the canal in 1876 of raw cotton, unmanufactured tobacco, hemp, clover and grass-seed, flax-seed and hops was but $262; and the sum total of all the tolls paid on all the articles in 1876, which were made free in 1877, was but $316. And when it is remembered that the same list of articles embraced such great staples as beef and pork, live animals, raw cotton, seeds, distilled spirits, lard, domestic cottons and woolens, leather, lead, hops, hemp and furs, it will be clearly perceived how completely certain descriptions of traffic had been driven from the canals.

The results of the new policy (reduced tolls) for a single season's experience thus exhibit themselves, comparing the fiscal years 1876 and 1877:

	1876.	1877.
Tolls	$1,477,331	1,041,690
Tonnage	4,172,129	5,246,925

For the calendar years 1876 and 1877 the results were as follows:

	1876.	1877.
Tolls	$1,340,003	$880,896

For the calendar year, 1877, the commission has no exact figures respecting the increase of tonnage; but as whatever of increase took place occurred mainly during the calendar year. An increase of about 1,000,000 tons may be assumed. On such an assumption, the result of the new policy was in brief as follows: Loss in revenue, with a reduction in tolls of nearly 50 per cent, about 34 per cent; gain in tonnage, 20 per cent.

If we analyze the several items which represent the increase of canal tonnage for 1877, under the new system, the mystery of the comparatively small falling off in revenue (considering the great reduction in tolls) at once reveals itself. In the first place, attention should be particularly directed to the circumstance that during the fiscal year 1876, out of a total revenue from tolls levied on merchandise (tolls on boats and passengers excluded) of $1,223,213, two classes of freight paid a toll for the use of the canals of $985,086, or over 80 per cent of the total amount received. These two classes were lumber and breadstuff, or, to adopt the canal designations, "*products of wood*" and "*vegetable food.*" Now, had the falling off in revenue from the tolls levied on the transportation of these two classes of commodities kept pace in 1877

with the reduction of tolls, the revenue from breadstuffs and lumber in 1877 would have been less than $500,000; but, instead, we have the gratifying fact that the actual revenue accruing from the movement of these two classes of products for 1877 was $703,927.

The most remarkable increase in tonnage that has accompanied the reduction of tolls in 1877 was in the case of vegetable food (breadstuffs), the actual tonnage being in

1876 (fiscal year)	1,064,293	Tons.
1877 "	1,502,544	"

Increase in 1877, 41 per cent.

Comparing the movement of breadstuffs for the calendar years 1876 and 1877, the results are even more favorable, and are specifically reported by the Canal Auditor to have been as follows:

Tons of flour and grain carried in 1877	1,412,317
" " " " 1876	966,405
Gain in 1877	455,912

or 47 per cent.

In respect to the products of the forest, the increased movement on the canals for the fiscal year 1877 over 1876 was as follows:

1876	1,175,313
1877	1,312,454

Increase 11 per cent.

The greatest *absolute* increase of tonnage moved in 1877 on the canals under the reduced toll system was, however, in the class of manufactures, comprising oil-cake, furniture, pig-iron, bloom and bar iron, castings, domestic and foreign salt. In 1876 the total movement on the canals of these commodities was returned at 180,201 tons; and in 1877, it rose to 480,513 tons, an increase of 165 per cent. The revenue from this source was, by reason of reduction of rates, but $27,295 in 1877, as compared with $39,731 received from the same sources in 1876.

Another result afforded by the business of the canals for 1877, which is certainly very curious, is the very small tonnage movement — absolutely and comparatively — on the canals of the commodities which, under the new toll system, have been placed on the free list. The total quantity of commodities freed from toll carried in 1877 on the canals was 26,088 tons; which compared with the total movement for the year of 5,246,928 tons of freight paying tolls, was about *one-half of one per cent.*

Three items in the free list comprised more than one half of the total percentage, namely:

Pork	6,018	tons.
Lard, tallow and lard oil	5,089	"
Dried fruit	3,223	"
Total	14,330	"

The total estimated value of all the products or commodities carried free from toll on the canals during 1877, was $10,488,073. But of this total value more than one-half was represented by one item, namely, that of domestic woolen goods valued at $5,672,312, and representing in weight 2,532 tons. The question which naturally suggests itself in considering this circumstance is: cannot so valuable a product and of such comparatively small bulk afford to pay a toll which would barely equal a small percentage of its value?

Domestic woolens, also now on the free list, were returned as representing a movement of 2,519 tons, and $1,100,320 in value.

The total exports of grain by canal from Buffalo from the opening of navigation to December 1, 1877, were 48,425,968 bushels, as compared with 27,615,023 bushels shipped during the corresponding period in 1876; and 35,589,375 for 1875.

The number of boats cleared at Buffalo during the season up to December 1, 1877, was 6,908, as compared with 4,850 in 1876; and in New York, 4,531 in 1877, against 2,319 in 1876.

The gain in transportation on the lakes for 1877, it should be here noted, was greater than the gain in transportation on the canals. Finally, it further appears, that the rates in general, as established by the Canal Board in the spring of 1877, have proved satisfactory to the transporting or forwarding interests; and the year on the whole has been pronounced to be one of the most satisfactory to the boatmen in the history of the canals. The canal is reported to have been throughout the season in as good order as it ever was; and it has been pointed out by the President of the Buffalo Board of Trade, and others, that the canals have been almost uniformly in their worst condition, and their navigation most expensive for boatmen when the tolls have been the highest, and the large revenues drawn from their corrupted administration.

At the commencement of the season, canal freights for a time ruled very low; 4 cents per bushel for corn and $4\frac{3}{4}$ cents for wheat from Buffalo to New York in the first week in June; while the

average for the previous year, 1876, was 6.7 mills for wheat and 6.09 for corn. With even the present rate of tolls, one cent and $\frac{35}{100}$ on a bushel of wheat, and 9 mills $\frac{66}{100}$ on corn from Buffalo to West Troy, such rates of freight could afford little or no margin of profit to the boatmen or forwarders. As the season advanced freights advanced, and for the first week in August were $6\frac{1}{4}$ per bushel for wheat and $5\frac{1}{4}$ for corn, from Buffalo to New York; and with a return load of about 80 tons — the average for 1877, as against 44 tons in 1876 — which the boatmen, under the reduced tolls, generally obtained, the business became profitable. Later in the season freights still further advanced; namely, to ten and twelve cents per bushel for wheat and eight to ten and a half cents per bushel for corn, from Buffalo to New York; so that, notwithstanding the great reduction in the rates of toll, the cost to the shipper for transporting wheat from Chicago to New York by lake and canal has been higher the past season than before the reduction. "The average freight from Chicago to New York, including (the canal) toll, from September first to the close of navigation, was fourteen cents per bushel in 1877, and eleven cents in 1876."— *Report of Auditor*, 1878.

This very great advance in canal freights during the closing months of the season of 1877, and the large resulting gain to the boating and forwarding interests, was due mainly to the large wheat crop of the year, and a concurrent large foreign demand for it; which latter, for the time, more than exhansted the ability of the boats on the canal — reduced in numbers and quality by reason of the unprofitable business of previous years — to supply.

As these circumstances — large crops, concurrent with large foreign dema d — are not likely to immediately concur, they should be taken into proper consideration in estimating the result of continued low tolls on the business and profits of canal transportation for the immediate future; and modify any too sanguine expectations that might otherwise be indulged in. At the same time there would seem to be no doubt that the reduction of toll in 1877, as compared with 1876, did powerfully aid the canals in competing against the railroads for the transportation of grain during the past year and in determining the rates of freight, from the circumstance, that while in 1876, of the grain that came to New York, the railroad brought 61.54 per cent, and the canals 36.46 per cent; in 1877 the proportions representing this same movement are reported at 46 per-cent rail, and 54 per cent canal. As before pointed out, also, the total absolute gain, in the movement of vegetable food on the canals

for the season of 1877, as compared with the season of 1876, was 438,251 tons, or 41 per cent.

The change during the past year in the movement of pork and lard from the West to the East has been thus reported by Mr. Alonzo Richmond, President of the Buffalo Board of Trade.

"The rates of freight on these articles," he says, "by railroad from Chicago to New York, was nine dollars a ton; and by propellers and rail to New York, eight dollars a ton, before the tolls on the Erie canal were removed. Yet by a suicidal policy the tolls on these articles were kept so high that none of them were shipped by canal. The present rate of freight (August, 1867) by the railroads on pork and lard is seven dollars for all rail to New York, and six dollars if shipped by propeller and rail."

"The first shipments this season (1877) of pork and lard were made by propeller and steamboats on the Erie canal at four dollars per ton, and they went through in thirteen days, in as good, if not better order than if they had been sent by rail. Afterward shipments were made by propellors on the lakes and horse boats on the canal at three dollars a ton. Shipments have since been made by propeller on the lakes and by horse boats on the canal at two dollars and fifty cents a ton from Chicago to New York, including all transfer charges."

It is also important to here especially ask attention to a circumstance illustrative alike of the marked change for the better, which the events of the year brought to the boating interests on the canals; and also of the principle, that the best way of determining in taxation the influence or burden of any tax, is to ascertain and determine its relation to the profits accruing from the employment of the business or capital, on which the burden of the tax is primarily imposed; the tax invariably proving the greatest burden where the margin of profit is least. Thus, for example, the aggregate underwriters valuation of all the first, second and third class boats on the New York canals in 1871 (5,267 in all), was $9,076,700; for 1874 (5,837 boats), $7,881,700; and for July, 1877 (5,495 boats), only $4,921,200.

Here, then, was a reduction in the valuation of the boating instrumentalities or capital employed on the New York canals of $4,155,500 in the six years from 1871 to 1877, or to the extent of nearly 50 per cent. In fact, the case might be presented even yet more forcibly; for, at the opening of the canal season in 1877, there was little or no demand for boats, and a commodity for which there is no demand, or prospective profit in owning or using, has

little or no market value; and canal property at that time really had very little market value. The general result of the season's business on the canals was, however, to render the use of boats, which had before been wholly unprofitable, or attended with little profit, fairly profitable; which in turn, occasioned such a demand for boats, as to greatly increase their market value as instrumentalities for carrying on a remunerative business; and this increase in valuation, or rather in the price which all the first, second and third class boats would sell for, over and above the prices attainable for the same in the spring of 1877, has been estimated for the Commission, as high as two millions of dollars; or nearly twice as much as the total revenue derived from the use of the canals for the entire fiscal year of 1876–77. In estimating the beneficial results of the past year, the effect on the capital invested in canal work, as well as the increase in tonnage moved, should therefore be taken in account.

It is the opinion of some, that this increase of business, and consequent increase in the value of boats and in opportunities for the profitable employment of a large amount of labor that might otherwise have remained idle, is due entirely to the reduction of tolls made in the spring of 1877. Such an assumption is probably not fairly warranted; and yet there can be no doubt that the reduction of tolls was powerfully instrumental in producing the results cited. For if a point in the business of the canals had been reached (as it undoubtedly had), when receipts and expenditures for moving merchandise on the canals had attained a correspondence, or equilibrium, the inevitable result must have been (what actually occurred), namely, a decrease in bnsiness, and general stagnation. But if (as is certain, in the case of some articles), the reduction of tolls caused the receipts for forwarding to exceed the expenses of forwarding to even a slight degree, the result would be (as has been), a revival of business, and the profitable employment of all the capital invested in transportation; for if the margin of profit on specific transactions was small, it must be remembered, that small profits on very large transactions (such as the movement in the case under consideration, of over five million tons of merchandise), give results of the immense magnitude.

The Future System and Rates of Toll.

The necessity of the reduction of tolls effected by the Canal Board in 1877 having been demonstrated by the experience of the canals, alike before and since the reduction, and the wisdom of the policy adopted by the board in the Spring of 1877 having been

fully vindicated, the real question of moment—in comparison with which all that has been previously said is but rhetoric—now comes squarely up for consideration; namely, what shall be the rates of tolls on the canals for the immediate future, and in what manner shall they be levied and adjusted? That, in view of past experience and the future contingencies of active railroad competition, it will not be expedient to re-enact a system of tolls higher than is at present established would seem to be demonstrated. It is not to be disguised, moreover, that the present year in the life of the canals covers a most critical period. The elements of the future are in a great measure unknown. The effect of the constitutional provision, limiting inflexibly the amount of expenditure on the canals under every contingency, is yet to be determined. Those most conversant with the working of the canals widely disagree as to the sum that it will be necessary to expend during the current year under average and ordinary circumstances to keep them in good workable condition and collect the revenues. The business of the year is certain to be, in many respects, different from what it was during the last canal season. The crops of the United States are not likely to be as large, and with the discontinuance of war and the opening of the ports of the Black Sea, the foreign demand for American breadstuffs and provisions is likely to be less. The business of the country, as a whole, under the influence of continued vicious economic laws and worse prospective congressional legislation, may descend to lower depths of paralysis and unprofitableness than have yet been touched; and the railroads, the natural rivals and enemies of the canals, are likely to spare no effort to obtain the largest possible share of whatever of the transportation business the season may have to offer. Another matter having an important bearing on the future of the New York canals, is the enlargement of the Welland and St. Lawrence canals, now in progress and soon to be completed, and the prospective consequent increase of facilities, including cheapening of rates, for moving grain or breadstuffs from the northwest by way of Montreal and the St. Lawrence to the ocean, rather than by the New York canals and the various east and west lines of the railways of the United States to New York or other American seaports. That the government of the Dominion of Canada is of the opinion that the enlargement of the Dominion canals in question, accompanied by a deepening of the bed of the St. Lawrence in certain localities, will result in a large diversion of the grain movement of the northwest from its present routes, and in favor of the Montreal and St. Law-

rence routes to the ocean, is made evident by the large expenditures it is incurring for the purpose of effecting such improvements; $12,000,000 worth of work being reported as now under contract, with a contemplated further outlay at no remote future of some $17,000,000 additional.

Whether these expectations of great commercial changes, to the detriment of the New York canals, and the city of New York in particular, consequent upon the Canadian canal improvements, are likely to be fully realized, is an open question; and the Commission find a wide difference of opinion in relation to it among those well qualified to judge, to whom they have applied for information.*

In short, the results of the Canadian canal improvements, and how far these improvements are likely to be offset or compensated for by the reduction of tolls and expenditures on the New York canals, and the introduction of cheaper methods of boat propulsion or towage on the same, are matters that can only be determined by experience, and in the absence of such experience it is useless to now speculate.

The attempt, under such circumstances, with so little actually

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* The following responses made to the Commissioners in answer to requests for information, strikingly illustrate the great difference of opinion touching the results of the enlargement of the Canadian canals, entertained by those conversant with the subject:

An extensive lake vessel owner states in substance; that the time consumed in navigating the Welland canal, as well as risk of damage to vessel and locks, through the narrowness of the channel and other causes, will constitute insuperable objections to its use by vessels of 50,000 to 60,000 bushels capacity; that large vessels cannot be used profitably, as the cost of their construction is so great; that a sail vessel can only make five round trips from Chicago to Kingston during the season, instead of eight to Buffalo; that the large vessels now navigating the lakes cannot use the canal economically, as they are not adapted to the trade; that, taking the relative cost of canal boat stock and lake vessel stock into consideration, it will be more profitable to use both classes *via* the Erie canal, as no commensurate advantage will be gained by adopting the St. Lawrence route.

A prominent insurance man, well versed in all that relates to marine matters, gave the following answer to inquiries: "Our lake vessels of the largest class, "with very few exceptions, will pass down. The Canadians are sharp, keen "people; ready to adapt themselves at once to any means promising to improve "their condition. They are staking almost everything on this vast improvement "of the enlarged Welland canal. There will be no lack of investment of money "to stock it to its utmost capacity, during the navigable months, with vessels and "cargoes. The enlargement of that canal will open up a trade both ways that "can but be very large, and will form a new era in the trade and commerce by "that northern route."

A Western gentleman, holding an important commercial position, also writes thus: "The great enterprise of our Canadian friends will, I think, be likely to "divert a very considerable amount of foreign-bound produce through their chan-

known of new conditions from actual experience, and so much depending on the experience of the future, to determine what is the best immediate or near future policy for the New York canals, is not an easy matter. And there would seem to be but one path that can at present be safely and wisely followed; namely: to attempt to find out what is the highest basis of economic principle, and then base action as far as possible upon it and bide the result; confident that nothing but happy accidents can afford any better result.

And, at the outset, in attempting to ascertain this basis, the Commission cannot refrain from expressing their astonishment at the method of assessing tolls on the canals, that always has been, and still is adopted. Even under the revised, reduced and much improved system adopted in the spring of 1877 and now in force, there are *eleven* discriminating rates of toll, exclusive of lumber or products of the forest; and this latter class of commodities has *nine* different or discriminating tolls levied upon its movement. Thus, for example:

Lumber No. 1, comprising white pine, basswood, etc., pays

"nels when the Welland canal shall be enlarged, so that our largest craft can "pass through to Kingston. Already they make very low rates for such ship- "ments, and will be able to make them somewhat lower when they can use the "larger vessels. * * * * From a statement I made last year of the "relative cost of moving wheat from Chicago to Liverpool by several routes, it was "shown that even under the extremely low freight rates then prevailing on the "Erie canal, the Canada route was no mean competitor. I think, with an en- "larged Welland canal, they would come close on to the rates that could be "made *via* Buffalo and New York. I do not know any reason why in midsum- "mer they ought not to have ocean freights as low from Montreal as from New "York. If it be true that with that enlargement they can take grain as cheaply "to Europe as the Erie canal can do, then the route will be an active competitor "for that business, and the minimum of charges of every sort must be adopted to "prevent a diversion from New York. I am also inclined to the opinion that with "an enlarged Welland canal a very considerable portion of the New England sup- "ply trade would go to, say Ogdensburgh, and then be distributed to points where "needed. This would be a very considerable diversion from Buffalo, but perhaps "not much from the Erie canal, as I suppose the most of this business goes by rail- "road from Buffalo. * * * On the whole, I think, there will be found "a very active competition between the two routes after the Welland shall be en- "larged, and it will require not only the lowest possible schedule of tolls on the "Erie, but also improved facilities and cheapened charges in New York, and a "lower charge at Buffalo for elevating than has been current for the average of "late years, to prevent a large diversion through Canada for foreign-bound ship- "ments and through the Welland to New England points. * * * The "business must, in my judgment, be governed by the same rules of competition "that apply to private enterprises; all unnecessary expenses must be cut off— "whether tolls, terminal and intermediate charges, or any thing else—all must be "brought to the very lowest point."

$\frac{75}{100}$ mills per 1,000 lbs. per mile. Ash, black walnut, beach, etc., $\frac{50}{100}$ mills per 1,000 lbs. per mile. Hemlock and spruce, $\frac{35}{100}$ mills per 1,000 lbs. per mile. Boards, planks, scantlings, railroad ties, pickets for fences, etc., $1\frac{1}{2}$ mills per 1,000 *feet* per mile. Hemlock and spruce, when not weighed, 1 mill per 1,000 feet per mile. Lumber transported in rafts, 1 cent $2\frac{1}{2}$ mills per 1,000 feet per mile. Sawed stuff for window blinds, 2 mills per 1,000 lbs. per mile; and timber, squared and round, transported on boats, 5 mills and 3 mills per 100 cubic feet respectively, according as it may happen to be, hemlock or not hemlock.

Again, if a boat moving on the canals contains gas-pipes, glass-ware, grease, and handspikes, it would be subject to pay four different rates of toll; which in turn would necessitate the employment of an inspector, a carefully drawn manifest, and more or less consumption of time. The gas-pipes would pay, per 1,000 lbs. per mile, 5 fractional mills; the grease, 1 mill and 5 fractions; the handspikes, $7\frac{1}{2}$ fractions, and the glass-ware, 1 mill.

If the boat contained iron in sheets, and articles manufactured from iron, the former would pay 1 mill, and the latter $\frac{1}{2}$ mill per 1,000 lbs. per mile, respectively.

In fact, one can hardly resist the conclusion, as he studies the subject, that these discriminations were made originally to favor some individual or private interests, and have been continued ever since, to the detriment alike of the canal exchequer, the forwarder, and the consumer, because the precedents had long been in favor of their continuance, and it was easier to continue what was old than inaugurate something new.

The present free list comprises twenty-five different articles. It has already been stated that the total amount of goods on the free list transported on the canals during the past season was only about *one-half of one per cent* of the total movement for the same period.

In view of these discriminations, the apparently simple question, "What is the Canal?" becomes eminently worthy, at the present time, of careful consideration. Is it a highway toll-road, whereon every body who can control a boat is at liberty, by paying a stipulated and fixed toll, to employ his boat; or is the canal to be classed in the same category and come under the same rule as a railroad, which is, with few exceptions, used exclusively by the corporation which built it? The question ought not to be a difficult one to answer and decide; yet as it is answered and decided, judgment will be given for or against the continuance of the long-sanctioned

and present discriminating canal toll system. Let us therefore reason about it a little.

A railroad corporation is a common carrier, and holds the same relation to the community that the canal boat owner, who carries freight for a price—which, making allowance for the law of competition, he is free to himself determine—holds to the public. Hence a railroad can properly discriminate in the rates it will charge for the transportation of different descriptions of merchandise. But the State, which built the canal and throws it open to the public, and furnishes nothing more than the water-road is in exactly the position of a State, county, town or corporation which builds a turnpike or a bridge. But who ever heard of the directors of a turnpike or of a bridge charging a different rate of toll on a wagon-load of handspikes and a wagon-load of grease; or a wagon-load of sheet iron, and a wagon-load of manufactures from sheet iron?

Is it not, therefore, apparent, that as long as discriminating tolls are levied by the State on similar kinds of freight, carried by canal boats on the State's public water highway, no just and adequate results are likely to be obtained? In short, such a system of collecting revenue must of necessity be prejudicial to revenue, by entailing complex and inquisitorial methods of collecting it, which by their cost and annoyance will more than counterbalance any gain that can accrue from discrimination; especially, when as in the present case, the maximum rate charged upon any transported commodity is likely to be so small as to render any possible discrimination a matter of very little absolute importance. Whatever of tax the State may levy and collect for the use of the canals has got to fall upon and be paid by the commodities transported on the canals; and the most simple system that can be devised to assess and collect the tax is likely to prove the most productive, the most economical, and the most equitable.

To further aid in determining the correct principle according to which tolls should be levied for the use of the canals, attention is next asked to the following analysis of the business transacted on the canals during the fiscal year 1877, and from whicht he revenues of the canals were derived.

Thus, out of a total tonnage of 5,273,013 tons transported on the canals during the last fiscal year (1876–77), the following *three* items, or classes of products contributed an aggregate of 4,103,551 tons:

	Tons.
Lumber and wood	1,308,477
Vegetable food, including flax, grass and clover seeds	1,508,173
Coal	1,286,881
Total	4,103,551

Leaving 1,169,462 to represent the tonnage movement of all other articles, or commodities. But if we analyze this 1,169,462 tons not comprised in the above-mentioned three classes or items of commodities, we shall find that 904,749 tons were represented in 1877 by the following additional few products:

	Tons.
Salt	424,724
Iron ore	250,573
Stone, lime and clay	150,283
Iron of all kinds	79,169
Total	904,749

Leaving only 254,713 tons—or less than 5 per cent of the total tonnage to represent the canal movement of all other articles known to commerce for the season under consideration.

The lessson from these results is of the greatest importance, and is to this effect: Ninety-five per cent of the business of the canals consists in the transportation of coarse, bulky and comparatively cheap articles; and the largest proportion of these are, in the broadest sense of the term, agricultural products.

The main sources of revenue to the canals are from tolls on the transportation of two items or classes of commodities—lumber and vegetable food—and the entire system of tolls ought to be adjusted almost exclusively with a view of meeting the requirements of these two items or classes of commodities. Under the reduced system of tolls in force during the season of 1877, the movement of vegetable food on the canals increased 41 per cent, and the products of the forest 11 per cent. If by further judicious administration and continued low, and further simplified tolls, the aggregate movement of vegetable food and forest products on the canals for the season of 1878 can be increased over the corresponding movement for the season of 1877, to the extent of only *ten* (10) per cent, the result will be a gain in tonnage more than eight times in excess of all the tonnage that the canals transported free from tolls during the fiscal year 1877. If the aggregate tonnage of vegetable food, lumber, coal, salt, iron ore, stone, lime and clay, and the pro-

ducts of iron moved on the canals in 1877 can be increased ten per cent for the season of 1878, this increase will be nearly equivalent to the tonnage movement of all other commodities, of every name and nature, on the canals during the fiscal year 1877.

The Three Methods of Collecting Revenue From the Business of the Canals.

Practically, there would seem to be but three methods available for collecting revenue for the use of the canals; and, in the order of their simplicity, they may be enumerated as follows:

First.—A uniform toll or charge per boat per mile, moving east and west, respectively.

Second.—A uniform rate per ton per mile on all products or commodities, moving east and west, respectively.

Third.—A system of tolls, discriminating moderately in respect to certain products or commodities.

Another system of tolls was proposed in the Constitutional Convention of 1867, by Hon. S. Townsend, a delegate, with a view of relieving "greatly, in matters of details, the officers charged with the duty of the arrangement of the tolls and the custody of the (canal) money," namely, *a license system.* The author, in a speech submitting this proposition, said that, in effect, it would be "saying to each boat at the beginning of the year: Here, take this license; make your freight what you please, and take what you please." *See Proceedings and Debates, Constitutional Convention*, 1867–68, *p.* 2037. As, however, a license system (as proposed), to be equitable and, from a revenue point of view, reliable, must be based on the boat tonnage movement, or the tonnage of commodities annually moved, it would be, in fact, but a modification of the methods, Nos. 1 and 2, above suggested.

Assuming, then, that one of the three methods enumerated must be the system adopted, so long as an attempt is to be continued to make the canals self-maintaining, consideration is next asked to the operation of systems Nos. 1 and 2, in detail, and the amount and the rate of toll or charge that would accrue under them, on the basis of the movement or business on the canals for the past fiscal year, 1877.

First. The Boat per Mile System.

During the season of 1877, the mileage of boats engaged in transportation on the canals is reported by the Canal Auditor to have been as follows:

Eastward bound	3, 458, 655 miles.
Westward bound	3, 560, 960 miles.

Assuming next, as a matter of expediency, that the tolls on boats proceeding westward *from* tide-water, should be *fifty* per cent less than boats proceeding eastward *to* tide-water, a rate of *eighteen* (18) cents per mile, per boat, irrespective of all contents of the boat on all eastward bound boats; and *five* (5) cents per boat, per mile, on all westward bound boats, would, on the basis of the canal business of 1877, yield a revenue of about $800,000. For example, and using round number:

3,500,000 miles east, at 18 cents per mile, per boat, gives	$630, 000
3,600,000 miles west, at 5 cents per mile, per boat, gives	180, 000
Total	$810, 000

The important point that next presents itself for consideration is: What burden will this boat per mile system, of tolling, impose on the average boat, in comparison with the burden entailed on the boat by the existing toll system, *i. e.*, that of 1877?

The entire distance to be traversed from Buffalo to tide-water, or the reverse, is 347 miles; which mileage at 18 cents toll per mile *east*, gives a charge or toll of $62.46 per boat, moving the whole distance; and at 5 cents per mile toll *west*, $17.35 per boat, also moving the whole distance.

Now, the average rate of toll for eastern bound freight on the canals for 1877 was $1\frac{1}{10}$ mills per ton per mile. If the average boat cargo is 200 tons (it was 197 tons for 1875, and 209 tons for 1876), and is charged $1\frac{1}{10}$ mills per ton per mile, the existing toll (estimated on the boat) on 347 miles would be $79.34 east, which is evidently a higher rate than is proposed by this scheme. On the other hand, the average toll as charged on western bound freight on the canals for 1877, was $\frac{70}{100}$ mills per ton per mile; which assuming that the average western bound cargo is fifty tons, would make the existing toll (estimated on the boat) $12.15 per boat; or

with a cargo of 80 tons, the average for 1877, $19.43. There would be no difficulty, however, in apportioning the toll per boat, per mile, differently, if it was desired to differently apportion the charges on east and west freight movements; or to obtain a larger annual revenue than $810,000 from an equivalent of the canal traffic of 1877. Thus by increasing the toll or charge per boat per mile east to 20 cents, and allowing the toll of five cents per mile west to remain unchanged, the prospective revenue, adopting the mileage of 1877, would be as follows:

3,500,000 miles east, at 20 cents per mile per boat....	$700,000 00
3,600,000 miles west, at 5 cents.....	180,000 00
Total.....	$880,000 00
Average toll per boat east.....	$69 40
Average toll per boat west.....	17 35

This simple method of tolling will, therefore, easily bring (provided the business is transacted) any definite amount of revenue that may be considered requisite or necessary to draw from the canals, with an avoidance of the use of weigh-locks (after the tonnage of the boat has been once ascertained), and all necessity for the employment of inspectors and detailed manifests of the contents of boats or the several items of their cargoes. The rate of toll necessary to yield $880,000 per annum, assuming the amount of business transacted on the canals in 1877 to remain unchanged, would also be a less burden on well-loaded eastern-bound boats than the existing rate or toll on the same at present rates. Tolls on rafts of lumber, timber or bark might be assessed under Schedule No. 1, as proposed under Schedule No. 2.

The Commission find, however, so strong objection to this simple boat toll as a means of collecting the canal revenues, mainly on the ground that the change is too radical, contrary to all precedents, and as affording an apparent advantage to newly-built boats possessing large capacity, and commanding, by reason of their quality, the highest rates of freight, that they have little expectation that it will find favor or be adopted. Theoretically it is the best plan; and can any thing ever be practically wrong that is in truth theoretically right? In point of simplicity, and as placing the canal as near as possible in the position of a turnpike road—which is its true position—it would seem to be the best plan, and a brief experience would undoubtedly demonstrate it to be such.

The fact that the average tonnage of boats on the Champlain canal is much less than on the Erie or Oswego canal (for the year 1877, 106 for the former, in comparison with 214 for the two latter), need not militate against this system; as in the case of an entire line of canal using boats constantly of a smaller capacity, the toll, per boat, could be proportioned in such a way as to make the average charge on all the canals uniform and equal.

SECOND. THE UNIFORM RATE PER TON PER MILE SYSTEM.

This system will, undoubtedly, commend itself to the majority of those interested in the canals as more practical, and as free from the objections which may be urged against the boat per mile system. The estimated results of the practical application of this system (No. 2), afford the following exhibit:

For the fiscal year 1877, the total tonnage movement per mile east and west respectively, for 1877, was as follows:

Tons moved one mile east.....	679,281,764 tons.
" " " " west.....	178,078,797 "

The average toll per ton per mile moved east in 1877, was, as near as possible, $1\frac{1}{10}$ mills; and the average toll per ton per mile moved west, was $\frac{70}{100}$ mills per ton per mile.

A uniform rate of *one* (1) mill per ton per mile for all freight moved east, and one-half mill ($\frac{50}{100}$) for all freight moved west, would on substantially the basis of the movement for 1877 give the following fiscal results, or revenue:

East, 680,000,000 tons, one mile, at 1 mill.....	680,000
West, 180,000,000 " " " " $\frac{50}{100}$ mills...	90,000
Total.....	770,000

The rate per ton as here proposed, would be a reduction of ten per cent on the present tolls on all east bound freights (estimated from receipts of 1877), and $28\frac{1}{2}$ per cent reduction of tolls on all Western bound freight. To obtain the above revenue, also presupposes the entire abolition of the free lists. But, with such a reduction of rates, there ought not to be any free list or any valid claim preferred for the exemption of any article; with the possible exception of the article of coal. And the experience of the canals with this article for the two years 1876 and 1877 is worthy of attention. Thus, in 1876, with a toll of one mill per ton per mile, 1,036,698 tons were moved, giving a revenue of $113,079. In

1877 with a toll of one-half mill per ton per mile, 1,286,881 tons were moved, giving a revenue of $85,504.

One difficulty in the way of the adoption of this simple plan of a uniform toll per ton per mile, however, presents itself; not fatal, but somewhat embarrassing; and to be regretted as possibly precluding the attainment of complete toll uniformity. More than one-fourth of the revenue derived from the canals in 1877, namely, $241,546 out of a total of $880,896, was received from products of wood — timber, lumber, etc., which were charged tolls in large proportion by the 1,000 feet, and cubic feet, and not by the 1,000 pounds per mile. For example, the revenue collected on timber, lumber, etc., in 1877 was:

EAST.

	Tolls.
Boards and scantling, per 1,000 feet	$195,883
Shingles per *M*	5,679
Timber per 100 cubic feet	19,074
Wood per cord	5,737
Total	$226,373

WEST.

	Tolls.
Boards, scantling, etc., per 1,000 feet	$1,086
Shingles per *M*	21
Timber per 100 cubic feet	43
Wood per cord	253
Total	$1,403

In fact, staves appear to be practically the only products of wood which are now assessed and pay toll by weight per mile, and with the following results for the year 1877:

EAST.

	Tolls.
Staves, ½ mill per 1,000 lbs. per mile	$13,490

WEST.

Staves, ½ mill per 1,000 lbs. per mile	49
Total	$13,539

The reasons assigned for the assessment of tolls on lumber by the 1,000 feet, rather than by the 1,000 pounds, or ton, per mile, are, that different varieties of lumber vary in weight; that all green lumber is much heavier than a corresponding quantity of dry lum-

ber, and that it is not fair to discriminate adversely against those who may desire to transport their lumber to market in a *green* rather than in a *dry* condition; or by reason of a lack of capital, may be unable to retain it in possession for a length of time sufficient to season it for market.

On the other hand, the Commission are informed by those competent to express an opinion, that, however much the above reasons for the enactment of discriminating tolls on lumber may have availed in the past, they are practically of very little importance at present; that nearly all the lumber at present transported on the canals is moved by large dealers, possessing ample capital; that very little lumber in an unseasoned condition is now ever transported on boats; and that, with the present low rates of toll, any discriminations on dry lumber by reason of differences in specific weights is of very little importance in comparison with the advantage of having the tolls, as nearly as possible, uniform and simple.

If these latter representations are correct, and the Commission are inclined to think that they are, then the true course to be taken in arranging the system of canal tolls, is to assimilate, or class lumber of every description transported in boats — except wood for fuel — with other merchandise, and impose on it a corresponding toll of $\frac{1}{2}$ mill per 1,000 pounds, or one (1) mill per ton moving east. As practically no lumber moves west on the canals, the uniform toll rates on western-bound freights which have been recommended under this system, may remain unchanged.

If, however, it should seem desirable to the Canal Board to permit lumber moved on boats to be assessed *by measurement* as well as *by weight*, the corresponding tolls—assuming 1,000 feet of dry lumber to be equivalent to 3,000 pounds — would $1\frac{1}{2}$ mills to $\frac{1}{2}$ mill; so that the toll schedule would read:

On lumber of all descriptions — other than wood for fuel — transported in boats by weight, $\frac{1}{2}$ mill per 1,000 pounds per mile.

On lumber of all descriptions — other than wood for fuel — transported in boats, by measurement, $1\frac{1}{2}$ mill per 1,000 feet per mile.

These rates are a reduction of one-third on the present tolls on some descriptions of lumber transported in boats — white-pine, white-wood, bass-wood, cedar, boards, planks, scantlings — or from $7\frac{1}{2}$ fractions of a mill to 5 fractions per thousand pounds per mile. But can any good reason be assigned why lumber as a commodity should be subjected to any greater, or any less toll than pig-iron,

corn, ores, furniture, clay, sand, etc. ? The rates on oak, hickory, beach, sycamore, black-walnut, butternut, maple, ash, elm, fir and staves, under the proposed modifications, would remain the same as at present, when transported by weight. The rates on hemlock and spruce now $3\frac{1}{2}$ fractions of a mill per 1,000 lbs. per mile would be advanced to $\frac{1}{2}$ mill, per 1,000 lbs. per mile transported in boats.

On wood, for fuel, the Commission would recommend a toll of one half mill (0.5) per cord per mile, transported in boats ; — present rate 0.4, an advance of one-tenth of a mill.

On wood, for fuel, carried on rafts two (2) cents per cord, per mile (present rate).

On tan-bark, carried in boats, one-half mill ($\frac{1}{2}$) per cord, per mile.

On tan-bark, carried in rafts, two (2) cents per cord. per mile.

On timber, in rafts, one cent per mile, per 100 cubic feet.

If the movement of lumber, timber, etc., on the canals remains the same in 1878 as it was in 1877—no increase or decrease—the revenue in prospective, from the transportation of these classes of commodities will be materially changed. But, judging from the experience under the reduction of the tolls in 1877, it is not unreasonable to expect, that under the more simple system of levying tolls on lumber here submitted, the tonnage movement of lumber and the revenue from the same, will continue to increase.

The timber and lumber tonnage constituted in 1877 about 36 per cent of all the east bound freight on the canals, and only $1\frac{1}{2}$ per cent of all the west bound freight.

Steam yachts, and passenger boats, forming exceptions to all present business or movement on the canals, may properly be treated arbitrarily under any system of tolls, and continued to be subjected to existing, or any other rates, that may be deemed expedient.

Recapitulating in brief, the above facts, reasonings and deductions, the main points of Scheme No. 2, as modified to meet the conditions of the lumber and timber transport are as follows :—

Uniform rates for all commodities, other than lumber, moving east and west respectively. Restricting the assessment of lumber transported on boats to the 1,000 lbs. per mile system, and forbidding further assessments of lumber transported on boats by this 1,000 feet per mile system, a restriction which the Commission believe will not be attended with any disadvantages to the lumber traffic, the uniformity of this toll system would be complete, except in respect to the movement of wood for fuel on boats, and the movement of

timber, wood for fuel and tan-bark in the form of rafts. The rates of toll under Scheme No. 2, for western bound freight, furthermore, would be one-half the rates charged on eastern bound freight.

It would be possible to still further simplify Scheme No. 2, by imposing all the tolls on freights moving east, and entirely exempting from toll, all freight moving west. All tolls assessed for the use of the canals fall on the articles or commodities transported on the canals. This is an economic axiom. It is a further axiom, that the more simple the system for the assessment of taxes of any kind that can be adopted, the more perfectly the taxes will diffuse themselves ; the lighter the burden, and the maximum of economy in collection. A weight of fifty pounds fairly strapped on the back of an average man, constitutes no onerous burden ; but hung round the neck, or suspended from the fingers, its carriage for any distance would be impossible. In levying the tolls in part on eastern bound freight, and in part on western bound freight, the State in a measure undertakes to say how the tolls shall be distributed. In levying them all on eastern bound freight and exempting all western bound freight, the State practically leaves the boat owner, or forwarder to distribute them on the different movements and the different articles transported, as he may deem it expedient.

As before stated, the adoption of Scheme No. 2 and the proposed rates, would constitute a marked reduction of the existing tolls—approximately to the extent of 10 per cent on eastern bound freight, and 28 per cent on western bound freight. But taking into consideration the economy and simplicity of administration which the adoption of this scheme would entail, the commission feel sanguine that if the business of the canals is dependent on the degree of tolls to be levied for their use; on the manner of assessing the tolls, and on the ability of the canals to compete with the railroads ; the proposed uniform and reduced rules, will not only yield the revenue as above estimated, but will so augment the traffic, that an annual revenue of from $840,000 to $850,000 can be safely relied on.

If it is desired to effectually guard against any reduction of revenue below the amount realized during the season of 1877, it can be readily accomplished—supposing the business of 1878 to be the same as in 1877—by slightly advancing the uniform rates, as proposed by the commission, so as to make them correspond with the average tolls assessed during the year 1877—1 1-10 mills on eastern bound freight, and 70-100ths mills on western bound freights.

Under the existing toll rates, all vegetable food moving *east*—ex-

cept bran, apples and potatoes—are now charged 1-2 mill per 1,000 lbs. per mile; the articles excepted being subject to a toll of one (1) mill per 1,000 lbs. per mile; under the proposed new and uniform rate, the tolls on bran, apples and potatoes moving east, would therefore, be reduced one-half.

FREE COMMODITIES.

In the future administration of the canals one of two principles ought to be adopted and strictly adhered to. They should either be managed with a view of obtaining from their use, the largest revenue consistent with the fulfillment of their largest sphere of usefulness, or at least with a view of making them self-supporting; or for considerations of the general good, they should be entirely supported by the State, and their use made free to all who may desire to use them. The former has been and is now the policy of the State. It has, furthermore, got to be the policy recognized for some years, or until the existing constitutional provisions in respect to the canals, can be repealed, or amended. And until the canals are made free, the burdens and the exemptions, the taxes and the privileges, should to the greatest possible extent be apportioned with the utmost possible equality. To exempt, under existing circumstances, any commodity *which is able to pay toll* from its payment for its use of the canals, is to arbitrarily increase the burden imposed on all non-exempted products, or on the State treasury and the people; and the representatives of the great staple articles which pass over the canals and which, unless the canals are made entirely free, have got to be taxed or tolled, in assenting to any such exemptions are discriminating against their own interests. Clearly there can be no valid plea for the putting of any article on the canal free list, unless it be shown that the subjection of the same to tolls will seriously impair its transport on the canals, or give to the railroads an undue advantage in competing for its carriage. But under the proposed new system of uniform tolls the rates are so low that the commissioners (at least in part), doubt whether a valid claim for toll exemption or discrimination can be prefered for any article or product likely to pass over the canals in any quantity that will make it worth while to make a discriminating exception. In judging of the correctness of this opinion, the circumstance already noted should not be lost sight of, namely: that the free goods transported on the canals in 1877 constituted only about one-half of one per cent of the aggregate movement. Thus the total

tonnage, east and west, *paying toll* in 1877, was 5,246,925 tons ; total free goods, 26,088 tons.

But let us analyze this free list a little further. Of the 26,088 tons carried free from tolls on the canals in 1877, 11,124 tons were pork, lard and lard oil, and beef (of the latter 17 tons). Now, under the proposed new and uniform rate, of one (1) mill per mile per ton, moving east, an entire ton of pork, or six barrels, would be chargeable with a toll of 34.7 cents ; or at the rate of about $5\frac{1}{2}$ cents per barrel. There were 5,031 tons of lard and lard oil moved over the canals in 1877, the returned value of which was $857,-734. Had a toll of one mill per mile per ton been levied on this quantity, and the same had been carried the whole length of the canal, the total charge (5,031 tons × 347 miles = 186,457 tons one mile), would have been $186.45, or about one-seventh of one mill per cent of the value of the commodities in question. The rate of freight by railroad on pork and lard, in August, 1877, from Chicago to New York, was $7 (all rail); and six dollars if shipped by propeller and rail. At the commencement of the season, shipments of pork and lard were made from Chicago to New York by propellers on the lakes and by horse-boats on the canal at three dollars per ton ; and subsequently for two dollars and fifty cents per ton, including all transfer charges.

It is very true that so long as the great staple articles — the grain, the products of the forest, the salt, coal, iron-ore, stone, lime and clay — which furnish the great bulk of the business of the canals, are looked to for revenue, a free list of the character existing, and even with the additions recently proposed, is, from a direct revenue standpoint, a matter of little importance ; but, when the confusion that the engrafting of such a free list on a uniform rate per ton per mile system would inevitably entail, is considered; and also that such a list would compel the maintenance of an expensive clerical and supervisory corps that might otherwise be dispensed with, its further recognition and continuance becomes a matter of great importance and inconvenience. Every complication of rates in any system of taxation tends to corruption. Every simplification, on the other hand, is the surest guarantee against corruption and in favor of economy. A simpler system can be easier supervised and controlled ; a complex system is difficult to control, and expensive to supervise.

For instance, suppose a boat, freighted with commodities weighing 200 tons in the aggregate, to clear from Buffalo for New York, or tide-water. Under a uniform rate of one (1) mill, per ton, per mile, there would be no necessity for any manifests or inspection of cargo

but the boat would simply have to be weighed, and the toll per tonnage assessed. On the other hand, under the present system, which comprises eleven different and discriminating rates on commodities, other than lumber, and nine different rates on lumber, with a free list of of twenty-five separate and wholly incongruous articles in addition, no possible complete control and exactness in the assessment and collection of revenue is attainable, and none ought to be expected. If a boat, for example, carries ten tons of gas-pipe, and twenty tons of grease, the temptation is strong to reverse the items in any manifest, because the grease pays three times the toll of the gas-pipes. It is the characteristic of every system of taxation in operation in the United States—tariff, internal-revenue, State, town, city and canal—that it creates these temptations, and by arbitrary assessments, or administration, gives rise to a feeling on the part of the tax payer, that he has not been treated with equity; and yet pulpit, the press and the people wonder and deplore that the standard of public and private morality is not higher! A good place to begin reform is when opportunity presents; and the opportunity in respect to canal tolls is now presented; and a uniform rate of toll, as proposed, while simplifying the collection of the canal revenues, would at the same time be in itself a certain guarantee of an honest collection of such revenues.

THIRD—THE SYSTEM OF DISCRIMINATING TOLLS AND A FREE LIST.

If, however, in the opinion of the Canal Board and the legislature no radical change with a view of simplifying the system of levying and collecting tolls on the canals, is expedient or desirable; and Schemes Nos. 1 and 2 as above presented are not to be considered, there is no other alternative (if revenue for the use of the canals is to be sought for), but to maintain substantially the present system, with the rates as established in the spring of 1877. But this system without abandoning the principle of discrimination and exceptions on which it is based can in the opinion of the Commission be greatly improved and simplified by sweeping away the present long and complicated schedule of specific tolls on a large number of specifically enumerated articles, or products, and substituting a reclassification of products and consolidation of existing rates. Such a reclassification and consolidation based on no other principle than what is claimed to be present expediency, and representing the views of some of the most prominent and intelligent representatives of the canal forwarding interests, is accordingly here submitted, as system No. 3.

Productions of the forest, per 1,000 lbs. per mile... ½ mill
Vegetable food..... ½ mill
Merchandise, manufactures and all other articles or products not otherwise enumerated or specified. ½ mill
Timber in rafts per 100 cubic feet per mile..... 1 cent
Steam yachts and passengers, per mile.....10 cents

On Ashes, pot and pearl, Bricks, Brimstone, Bones, Coal Cement, Clay, Earth, Gypsum, Ice, Iron and all other ores, Pig Iron, Railroad Iron, Manure, Marl, Marble, Plaster, Pitch, Rosin, Sand, Salt, Steel, Spikes, Stone, Sugar, Soda-ash, Tar, Tin-plate, Tan-bark and Wood for fuel, and Leached Ashes, per 1,000 lbs. per mile, one-fourth mill.

FREE LIST.

Boats, Beef, Bacon, Bleaching Powders, Coffee, Cotton, Corn Meal, Crockery and Glass Ware, Domestic Distilled Spirits, Domestic Cotton, Domestic Woolens, Dried Fruit, Dry Hides, Fish, Flour, Hemp, Hops, Iron Pipe, Lard, Lead, Leather, Molasses, *Oils*, Pork, Prints, Rice, Stoves, Stove Castings and Stove Furniture, Tallow, Tobacco, Wool, Live Cattle, Horses, Hogs and Sheep.

In the schedule as above presented, no provision is made (and inferentially no permission is granted) for the movement of any commodity in the form of rafts on the canals, except timber.

The rates, or tolls, on freights moving east and west, respectively, are the same.

The free list, as at present existing, has also been materially changed and enlarged.

Under this system, and with the traffic remaining the same, the revenue derived from the use of the canals will not be materially different from what it would be if the existing rates of toll are retained unchanged.

TOLLS ON FOREIGN SALT.

Under the present system of tolls, all westward or upward bound freight on the canals pays one-half the rates imposed on the same articles moving eastward, with the exception of foreign salt. Such a discrimination in respect to this single product is in effect equivalent to the State saying to the representatives of the boating or forwarding interest; we propose to arrange the system of tolls on the canals in such a way as to enable you to compete to the greatest extent and to the best advantage with your formidable rivals, the

railroads, except in respect to one single article. On that we offer a premium, in the form of a higher toll than is imposed on any other similar product transported on the canals, in order that the railroads may have an opportunity to monopolize the whole movement of the article."

It is, furthermore, any thing but creditable to the Empire State, which proclaims to the world that the Erie canal, is a national inland highway, where tolls are now charged merely for the purpose of its maintenance, that it should discriminate in its regulations between a foreign product and a home product. When a foreign product has passed the Federal custom house and paid the Federal duties, it becomes in all fairness as much an article of American commerce as if it was originally of domestic origin; and to single out, as has been done, the article of foreign salt, and charge an exceptionally high toll for its transport on the Erie canal, solely because it is of foreign production, is simply a piece of class legislation, and an act unworthy of a great State and an intelligent people.

FREE CANALS.

On the subject of freeing the canals from all tolls and charges, the Commission not being unanimous, make no specific recommendations.

It is the opinion, however, of at least one member of the Commission, that to advocate the making of the canals entirely free, and to require the expenditures necessary to administer and maintain them to be paid out of the proceeds of general State taxation, is in effect to advocate the speedy abandonment and destruction of the canals. Such an advocacy is substantially an admission that the canals have outlived the purpose for which they were originally constructed, and that other agencies have come in, which can do their work cheaper and better. If such is the case, to contend against it is to attempt to overcome the action of natural laws; and there is no instance on record in modern history where State interference under such circumstances has been other than disastrous. It is furthermore a law or axiom in human nature and social economy that men never highly value that which it costs them little or nothing in the way of direct effort or expenditure to obtain. Some years ago, one of the States of the Federal Union found itself in the possession of a fund for the support of its public schools, so large as, in a great measure, or wholly to relieve the school districts of the State from the necessity of raising money by taxation for

ordinary educational purposes. The result was that the school system and standard of public instruction in that State rapidly ran down, and the indifference of town and district authorities to the condition of their public schools became notorious. But let us reason further on this topic. To make the canals free, a constitutional amendment is necessary, and this cannot be obtained under any circumstances in a lesser time than three years. It is not by any means certain, moreover, that a majority of the people of the State New York will vote for any such amendment. A portion of the people of the State feel little or no interest in the canals; while the tide of public opinion is everywhere running strongly against the increase of taxation for any purposes, and in favor of restricting State functions and public expenditures within the narrowest feasible limits.

Suppose, however, a constitutional amendment making the canals free, and requiring the cost of their maintenance and administration to be defrayed from the State treasury, to be adopted, and made part of the organic law of the State. The first one, two or three years, the annual appropriation might be voted by the legisture with a degree of unanimity. But how much shall be annually appropriated? The impolicy of a constitutional amendment limiting inflexibly the sum that can be expended in any one season under any circumstances on the canals, finds abundant demonstration in the present experience. If left to the legislature, one legislature cannot bind its successors, and a key having been once provided, whereby the public treasury can be readily opened under the plea of necessity, what effectual guarantee could be provided that the annual expenditures on account of the canals would not equal or be in excess of three millions, that were deemed necessary, and were used in 1873. Then would come disatisfaction on the part of the people, and charges of corruption on the part of one or the other of the political parties for political purposes. The railroads, the natural rivals of the canals, always a powerful interest in the State, and with the fresh grievance, that the State in making the canals free had discriminated unfairly against all other methods of merchandise transit through her territory, would openly or secretly, directly or indirectly, foment this dissatisfaction, and do all in their power to make the free canal policy a failure. The result of such a condition of affairs would be uncertainty in respect to expenditures, with a tendency to increase them; uncertainty in respect to appropriations; uncertainty in respect to general canal policy, ending in neglect of the canals, interference with or paralysis of their busi-

ness, general disgust on the part of the people, and an ultimate sale or abandonment of the property.

But suppose these gloomy anticipations to be ill-founded. The question, at least for the present, is not even then reduced to the alternative *of entirely free canals, supported by the State, or the ruin and abandonment of the canals.* There is no evidence that the canals have outlived their usefulness, and are unable, under proper administration and judicious tolling to successfully compete in respect to the transport of an immense tonnage of staple productions against the railroads.

On this point the Commission are unanimous, and believe that there is yet a large possible future of profit and employment for a judicious canal system as a means of transportation. The recent experience of France and Germany, as already shown, is evidence to the same effect. So is also the fact, that the English railways, among the best managed in the world, at present subsidize competing canals to maintain a maximum rate of toll; and that in spite of an active railroad competition, the English canals yet annually carry at a profit an estimated tonnage of some 23,000,000 tons. The present expenditure by the Dominion of Canada of very large sums, for the enlargement and perfecting of the Welland and other canals, is also demonstration, that in the opinion of the men of ability, who are directing such expenditures, the canal method of merchandise transportation is still able to successfully compete with any and every other existing instrumentality for effecting the same results.

In reality, the people of the State of New York have never yet had an opportunity to find out and fully test the power and capacity for usefulness of their great artificial internal water-ways. For the first time, under the pressure of necessity, the canals are to be brought under the superintendence of one competent and responsible head; a condition which in all other industrial enterprises is regarded as the prime essential for the attainment of efficiency and success. For the first time, plundering, extravagance and mismanagement have practically ceased; and irrespective of the labor and results of this commission, for the first time the wise step has been taken, of endeavoring to obtain information touching the economy of the canals, by independent, and carefully conducted investigation on the part of persons reputed competent to do such work and devoid of all personal or partizan interests in the results of their inquiry.

Again, the experience under the reduced tolls of the past year can hardly be accepted as a full and certain criterion for the future; but, as far as it went, it may be rightfully regarded as a success. The canals very nearly earned their expenses of administration and maintenance; and had there been a sufficiency of boats to meet the great demand for their use during the latter portion of the year, the receipts of the canals from tolls would have been considerably augmented. The further diversion of trafic from the canals was arrested, and no inconsiderable part of what in former years had been diverted, was regained. What the canals can do in another year, under continued low tolls, a better and simpler system of assessing tolls, and a wise, economical and concentrated superintendence, remains to be determined. But the fact that some two hundred and fifty new boats are reported as at present in the process of construction, as compared with a register of only seventy-five new boats in 1876, is evidence, that the boating and forwarding interests, studying closely the future from a dollar and cent point of view, are confident that the business of the present calendar year on the canals will be an improvement upon the last. The further fact pointed out by the President of the Buffalo Board of Trade that while from January, 1868, to January, 1877, the freight on flour per barrel by rail from Buffalo to New York was never less than 30 cents per barrel; while the canals during the past season carried flour in boat-load lots from Buffalo to New York, for twenty-two cents per barrel and to tide water on the Hudson for eighteen cents per barrel (the existing tolls in both instances included), is also demonstration that the canals in respect to this one article, in which the canals for years have been at disadvantage, do not stand in any special need of fostering by the State to enable them to withstand railroad competition.

If the canals, with a rate of toll bearing so lightly as not to prove obstructive on the immense traffic that tends to pass over them, can be made to provide for their own expenditures; or for their expenditures in part, they can prefer no more valid claim for exemption from such obligations, at the expense of the public treasury, than any other industrial, or business enterprise in which the public in all or part find an interest. And until further experience is gained in respect to this matter, it would seem to be the part of wisdom for those who have the continued use and prosperity of the canals really at heart to allow the question of freeing the canals to remain in abeyance.

In expressing the above views, the Chairman of the Commission desires to have it distinctly understood that he speaks for hims lf

alone. His associates on the Commission do not concur with him in opposing the free-canal movement; but on the contrary, are in favor of referring this whole question, at an early day, to the people of the State for consideration and determination.

Conclusion.

In conclusion the commission would acknowledge their obligations to various State officials—more particularly to the Comptroller and the Canal Auditor—and to gentlemen interested in the canals, and grain and produce business, both within and without the State, for their ready co-operation and supply of information. The task intrusted to the Commission has been by no means an easy one; the field to be occupied has been almost a new one, and the data requisite for forming an opinion in respect to many points are yet very imperfect, or almost wanting. In fact until the fiscal and calendar years of the canal operations for 1877 had closed, and the statistics of tolls, and traffic had been collected, verified and tabulated by the Canal Auditor, it was hardly possible to commence the investigation at all; and the results of another year need to be submitted to careful examination before any one, as the result of any amount of other consideration, can render himself fully competent to express a confident opinion as to the future.

Respectfully submitted,

DAVID A. WELLS,
L. J. N. STARK,
WILLIAM THURSTONE.

To the Canal Board of the State of New York.
Albany, *February*, 1878.

APPENDIX.

Relation of the Canadian and New York Canal Systems.

The following statement (prepared by Hon. William Thurstone, Secretary Buffalo board of trade, and a member of the canal commission), respecting the Canadian canals, their enlargement and prospective relations to the New York canals, and the trade of the State, and (more especially), of the city of New York, is also submitted for the consideration of the canal board, and the Legislature :

With the completion of the Welland canal, enlarged so that vessels of about 1,800 tons cargo capacity can pass through it, instead of 600 tons cargo capacity, as at present, with the same low tolls as are now imposed, and a very small increase in the cost incident to the traffic, relatively to the greater quantity of freight carried, it is reasonable to conclude that the rates of freight from Chicago to Kingston on wheat will be lessened at least one-half—that is from about seven and a quarter cents to three and five-eighths cents per bushel—tolls included. Vessels will then have the choice of sailing through Lake Ontario to Kingston, with their cargoes, if they can make more money than by discharging at Buffalo, or some American port on Lake Ontario (Oswego for instance). Hitherto, the larger class of vessels have been compelled to bring their cargoes to Buffalo. The inability of vessels of the largest size to enter Lake Ontario by the present Welland canal has certainly saved the commerce of the canals to the State up to the present time, while burthened with heavy canal tolls.

The merchants and people of the North-West confidently expect that a large direct trade will be carried on to and from western ports with Europe and other countries when the whole length of the Canadian canals is completed, and that it will no doubt be tried when the Welland canal is finished, without waiting for the enlargement of the St. Lawrence and other canals.

Ocean freights, from Montreal to Liverpool, during the season of navigation, are nearly the same as those from New York, Boston, Baltimore and Philadelphia. The distances by the New York and Montreal routes, from Chicago to Liverpool, are respectively as follows:

	Miles.
From Chicago to Liverpool via Lake Erie, Erie canal, Hudson river to New York, 1,502 miles; N. Y. to Liverpool, 2,980 miles	4,482
From Chicago to Liverpool via Lake Erie, Canadian canals, to Montreal, 1,418 miles; Montreal to Liverpool, 2,763 miles	4,181
Saving of distance in favor of the Montreal route	301

With a greater demand for return cargoes from Liverpool to Montreal, ocean freights would probably be lower as there would be more competition and the expense of the round trip would be very greatly diminished. Of course western merchants and producers would do all they could to accomplish this result, there being proverbially "no friendship in trade."

When the enlarged Welland canal is completed, it is expected that a large portion of the supplies of grain for the New England trade will avoid the canals and be taken through the port of Ogdensburgh, in consequence of the diminished cost of freight by that route.

It may be assumed as a fact that in future English capital will find its way, in an increased volume, to the west, and be there used to purchase grain, pork, lard and other articles, for English and continental consumption, as well as for the West Indies and South America. The direct importation of goods of all kinds from these places to Canada and the West would be another factor in the enterprise. The low rate of interest for money, in England, in comparison with that prevailing in the United States, becomes an element of great importance when brought to bear upon the question of competition between the routes through Canada on the one hand and the United States on the other. The opinion of a large proportion of the most thoughtful commercial men, in the State of New York, is that the best energies and foresight of the people of this State are needed to meet our northern competitor, especially in view of the fact that in a few years vessels of large tonnage will be able to make direct navigation from the upper lakes to the ocean. The size of the locks, when fully completed on the Welland and St. Lawrence canals, will be 45 feet in width and 270 feet in length,

with 14 feet of water on the sills, and the width of the canals 100 feet at the bottom.

The retention of the bulk of the trade of the northwestern States by the city and State of New York depends on the cost of transportation upon the canals of our State, and the tolls must be kept at the lowest point to meet the competition of the Welland canal, Lake Ontario and St. Lawrence river route. The increased capacity of vessels passing through the Canadian canals will correspondingly decrease the cost of moving grain.

The tolls on the Welland canal, including the right to pass the other canals free, are ten cents per 1,000 pounds, or six mills on wheat, five mills six fractions on corn, per bushel of 60 and 56 pounds respectively. The average time consumed in passing through the present Welland canal is forty-eight hours by sail and twenty-four hours by propeller or steamer.

The estimated expense for enlarging the Welland and St. Lawrence canals and deepening the bed of the St. Lawrence river so as to permit vessels of fourteen feet draft to navigate their waters is $30,200,000 -- of this amount there is work under contract for $12,-860,000. These facts show how strenuous are the exertions made by the Canadian government to wrest from us the prize of the western trade, and it is of the utmost importance to the people of New York that they should know that decisive measures are absolutely necessary and should be immediately taken to maintain the commercial prosperity of the Empire State by fostering in every way her canal interests.

It is impossible for the largest craft now navigating the lakes to pass through the Welland canal, but if the trip can be made at a profit by vessels of a smaller size, that route will be taken. The slow movement through that water-way for a few miles will be counterbalanced by other considerations, including the inducements to be found in the saving on the trip, as a whole, to tide-water and by return freights to the west. These facts are important. If owners of vessels find that they can obtain freight to Oswego or Ogdensburgh at remunerative figures, and these rates pay them better than Buffalo rates, they will seek these ports, and thus a large proportion of tolls and trade will be lost to the State of New York and pass through a part of Canada and over Lake Ontario.

When the Welland and other canals are enlarged ocean vessels may be seen on our lakes, and our shipbuilders will construct vessels adapted for both lake and ocean navigation, as the present craft go out of existence by age or disaster. If there is profit in the in-

vestment, English capital will be readily found to take advantage of the situation.

Whether the State of New York, and the cities of New York, Buffalo, Albany, etc., can retain the commerce of the canals of the State, even with a free canal, is the question of the hour. There is reason for doubt and alarm, but it is our duty to postpone the evil day as long as possible, or adopt some plan to ward it off altogether. If tolls on the canals are still further reduced or abolished, the water deepened, locks lengthened and widened, and steam applied as a motive power either by the Belgian cable system, or by propeller boats with "consorts" so as to reduce cost of movement, much will be done to aid the State in maintaining her commercial supremacy.

The lakes and canals are the cheapest and most useful means of transportation. If the merchants of Chicago, Milwaukee and other Western cities find it their interest to send grain to Europe via Montreal, purchasing abroad articles for consumption as return freight, they will do so if transportation rates are cheaper than by the New York route.

When her enlarged canals are completed, Canada will, for nearly eight months of the year, possess the most perfect system of inland navigation in the world. The work on the Welland canal progresses steadily, and the canal will soon be ready for navigation. It will be the finest work of internal improvement on the American continent.

The distance from Chicago to Montreal *via* the Welland and St. Lawrence canals is 1261 miles; the distance from Chicago to New York *via* Buffalo and the Erie canal is 1419 miles—or 150 miles in favor of the former route. The route first named has 70 miles of artificial navigation, with 56 locks and a total lockage of 564½ feet; the second 350 miles, 72 locks and 654 feet lockage. Thus there are 16 more locks and 89½ more feet of lockage on the New York than the Montreal route, with the advantage of a stronger current also in favor of Montreal.

Time is an important point to be considered in comparing the routes. A cargo of grain is brought to Buffalo from Chicago by propeller in about five days; allow one day for elevating and transferring to canal boats at Buffalo; then eleven days trip (by mule power) on Erie canal to tide-water and two days for towing from thence on the Hudson river to New York—altogether nineteen days. From Chicago to Port Colborne, the usual length of a trip by a propeller is five days; thence by Welland canal to Port Dal-

housie, Lake Ontario, one day; thence to Kingston one and a quarter days; one day may be consumed there in transferring cargo; thence from Kingston to Montreal by barges the time is three days; altogether eleven and a quarter days; thus showing a gain of seven and three-quarter days in favor of the Montreal route. (The time on the Erie canal is shortened about three days when steam is used.)

The average rate of freight per bushel of wheat from Chicago to Kingston during the season of 1877 was seven and a quarter cents by sail or steam, and from Kingston in barges (carrying 16,000 to 20,000 bushels) to Montreal uniformly three and a quarter cents; altogether about ten and a half cents, including half a cent as toll on canals and half a cent for transhipment at Kingston. The barge generally is taken alongside the ocean ship and three-quarters of a cent pay all remaining expenses. Ocean freights vary according to supply and demand for vessels; and the rates do not, to any noteworthy extent, differ from those prevailing in New York. The storage capacity of Montreal is 2,000,000 bushels of grain, and 200,000 barrels of flour. About ninety per cent of the grain shipped is purchased on English orders for cash, at western ports, and ten per cent on owner's account consigned to Great Britain and Ireland.

One of the reasons why the Welland canal has not been a more active competitor for the grain traffic of the west, for several years past, is the fact that its cargo capacity is limited to 600 tons vessels; hence the owners of craft of small tonnage, that used to carry grain to Oswego, do not find it profitable to engage in the trade in competition with the large propellers, barges and sail vessels that enter the port of Buffalo.

The cost of moving property by the Welland canal route in the future will certainly not exceed the minimum cost that can be charged by the Erie canal route in its present condition; terminal charges, ocean freights, etc., being equal.

Thus keen competition is certain when the Canadian canals are completed. Canada and England will then strive for the internal carrying trade by the lakes from the Western States, and the persistency, energy and financial ability of England are so well known as to leave scarcely a doubt of the ultimate success of the movement unless it is promptly met by corresponding efforts on our part.

In the New York Produce Exchange Report, for 1874–75, it is stated that "Practical experience has demonstrated that large vessels or ships can carry property more cheaply than small ones, the rates of cheapness being in about the proportion of the increased tonnage measurement. An increase of 150 per cent in the

capacity of vessels navigating the lakes and the Canadian canals, cannot but largely augment the ability of the St. Lawrence route to carry property at very largely diminished rates of transportation. The transportation rates on the Erie canal can only be further reduced to the extent of about seventy cents per ton by the abrogation of tolls except by enlargement. With the non-enlarged Erie canal and the enlarged Canadian canals, the power of competition will be unequal." The same writer intimates that it is a question to be solved in the future, even with the introduction of steam propulsion of boats or the Belgian cable system, together with the abolition of tolls, whether the Erie canal can compete with the Welland and St. Lawrence canals without an enlargement of considerable capacity.

It is certain that hereafter, no more lake vessels will be built—only the larger class of vessels can make a profit. In a few years the former will be swept away by wreck or old age. The "consort" and "barge" system will doubtless be improved upon, thereby lessening the cost of transportation.

The exigencies of the Canadian canals may require an increase of tolls, but the leading idea is to collect no more revenue from tolls than will be sufficient to keep the canals in repair and repay the cost of management. It is generally understood, however, that if the interest of the route demand it, tolls on the Canadian canals will be entirely abolished on vessels and cargoes *en route* to Canadian ports.

The only drawbacks or objections that have been started against the success of the enlarged Welland and St. Lawrence canal route in competition with the Erie canal are: Whether vessels of the enlarged capacity can successfully be floated on its waters; whether the trouble of entering and leaving the locks will not cause too great delay and be accompanied by great danger to the lock gates; whether the length of time required to pass through the canals will be so far increased as to take off the profit of the trip; and whether in the absence of return freights from Kingston, vessels will have to seek them from Oswego on Lake Ontario, or Buffalo, Cleveland and Erie on Lake Erie, thereby losing time and profit.

REPORT

OF THE

COMMISSIONERS

INVITED BY THE

CANAL BOARD OF THE STATE OF NEW YORK,

JULY 10th, 1877,

TO CONSIDER AND REPORT ON THE SUBJECT OF TOLLS UPON THE CANALS, HAVING REFERENCE TO THE SUBJECT OF REVENUES, AND ALSO TO INCREASING THE COMMERCE OF THE CANALS.

DAVID A. WELLS,
L. J. N. STARK,
WILLIAM THURSTONE, } *Commissioners.*

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